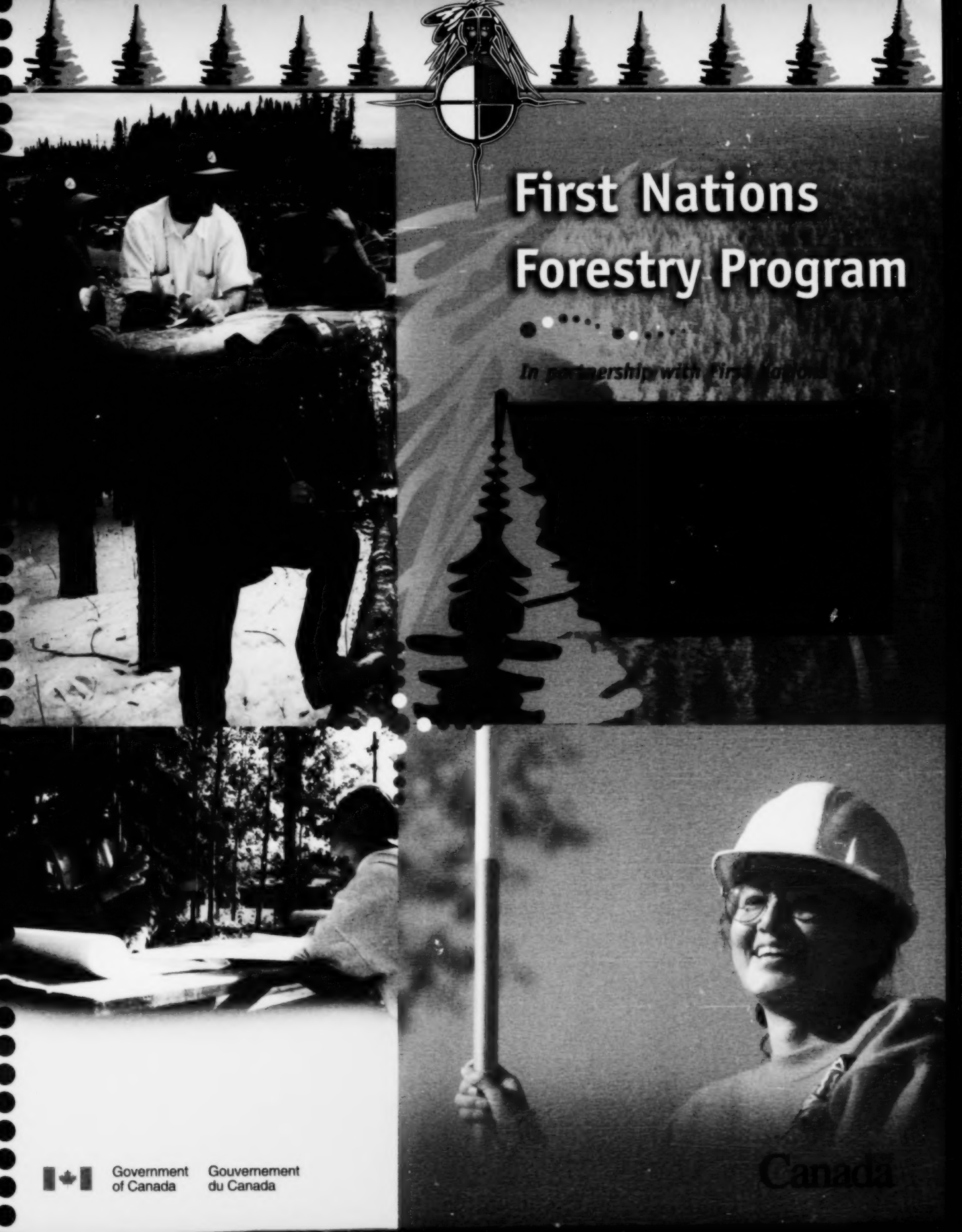

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The purpose of the
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Overview of the Forest Sector, Opportunities, and Aboriginal Forestry in the Yukon Territory

Final Report
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Executive Summary

ArborVitae Environmental Services and Dr. Gary Bull, Faculty of Forest Management, University of British Columbia, were engaged to assess potential opportunities for the involvement of Aboriginal people and communities in the forestry sector in the Yukon. The scope of the project was quite broad, including a review of Yukon demographics, the forest resource, the political context, and current and potential future involvement of Aboriginal people in the forest sector. The report covers many of these broader topics at a depth that the consultants felt was appropriate, but a detailed account of the political context, or of each of the 13 First Nations, for example, was beyond the scope of this project.

Currently, the Yukon forest sector contains some small companies that manufacture furniture stock and furniture items, a number of small sawmills, including portable sawmills, and fuel wood producers. Because there is, at present, a very small forest sector within the Yukon, especially in relation to the potential physical wood supply, this project is essentially concerned with forest sector opportunities for the Yukon as a whole. However, the report will focus on opportunities of especial relevance to First Nations.

The key demographic findings are that the overall population of the Yukon Territory is roughly 32,000 people, of which 23,500 live in Whitehorse. The population of the Yukon has only started to increase in 2003, following a six year period of decline. During the last ten years, the tendency has been for people to move to Whitehorse from the surrounding areas. First Nations people number roughly 7,500, or 23% of the total population, with higher proportions living in the rural areas.

The forest resource is boreal and concentrated in the southeast of the Territory, where Watson Lake is the regional hub. This is also the traditional area of the Kaska First Nation, who are among the First Nations that are most interested in forest sector development. The Teslin Tlingit First Nation, which has traditional territory in the south central part of the Territory, also has reasonable forest resources, as do the Champagne Aishihik, who are centred in the Haines Junction area. Other First Nations have varying amounts of forest resources, which are generally less productive and increasingly scattered among non-productive forest and non-forest, as one heads north, until the forest gives way to tundra.

There has been a great deal of debate and analysis to try to determine an allowable harvest level in the Yukon. At least six analyses have been undertaken within the past ten years, all with a variety of assumptions and on varying landbases. This has led to a great deal of confusion and uncertainty. In a recent study, Price Waterhouse Coopers (2005a) adopted a working estimate of 500,000 m^3/year as a reasonable, sustainable allowable harvest, most of which will come from the southeast part of the Territory – this seems reasonable to us. However, given the unfavourable economics of large scale industrial operations, determining the quantity of available volume is not a key concern.

The nature of the timber, the great distance of all points in the Yukon from major markets, and the flood of beetle-kill salvage timber from British Columbia means that there are essentially no opportunities at present for a standard forest sector to be developed. A recent report by Price Waterhouse Coopers (2005a) made this point clearly, and recent evidence (licences that have been issued but little harvesting has taken place) confirms this. During the past ten years, three or four sawmills have been established but gone bankrupt, and increased global competition (which has reduced product prices), an increase in the value of the Canadian dollar versus the US dollar, and higher energy costs have further decreased the economic viability of forest operations geared towards the production of commodities for export. We also found a distinct lack of interest among many communities for pursuing industrial timber projects, although some First Nations, such as the Kaska, are setting up the foundation for a more industrially oriented approach.

In contrast, tourism is steadily growing, albeit at a relatively low rate of increase. Most of the Yukon's tourism is centred on the natural environment, and the Territory is one of the few large areas of land anywhere with intact forests largely undisturbed by logging. The standing forests have value in supporting the tourism sector. Tourism also offers opportunities for First Nations people to develop businesses, but the involvement of First Nations in the tourism sector has been limited to date.

The First Nations people are very reliant on natural foods for a large part of their diet, especially game, fish, and berries. Many plants also provide traditional sources of medicine and are culturally valuable. Interview subjects estimated that in many communities, more than 75% of the meat consumed was from wild sources, and there was also a high consumption of berries. Because the forest provides these foods and medicines, the existing forest has significant value. We estimated that the annual value of wild meat produced from the forest was $11.3 million. The value of berries, medicines, and other foodstuffs was not estimated. In addition, furs and game licences contribute roughly $700,000/year to the trappers and the Yukon Government. In addition, one First Nation recently auctioned the right to hunt a Dall sheep – it was auctioned in Las Vegas and sold for almost US$200,000. This represents an obvious opportunity to derive some revenue from wildlife, but it only has such high values if pursued on a very small scale. Many of the First Nations people we spoke with felt it was immoral to profit from wildlife and so they stated that their communities would not undertake such a venture.

The outcome of this analysis indicates that at present, the value of the standing forest exceeds any benefits that might come from the development of a large forest products mill designed to use most of the maximum allowable harvest. Our vision of what forest-based opportunities exist for Aboriginal people and communities is as follows:

We have identified five areas where we think there are forest-based opportunities that might be of interest to First Nations communities:

- A small sawmill and log home production to supply the Territorial market;

- Wood used as biomass for energy production;
- Ecotourism;
- Biodiversity credits; and
- Carbon emissions offset credits.

The same factors which reduce the competitiveness of forest product exports from the Yukon also enhance the competitiveness of local forest products within the Territory. Thus, we feel that there is potential to locally produce lumber for the local market. This could involve expanding one or more of the existing sawmills, or the construction of a new, small-scale mill. There is also a market in the Yukon for logs for homes.

One of the most intriguing comments we heard from several interview participants was that there was a housing shortage in the Yukon. The cause of this appears to be the high cost of homes in the Yukon, which serves as a barrier to young adults moving out of their parents' homes. The size of the potential unfulfilled demand for housing is not clear; further analysis would be needed before such a project could be recommended with some degree of confidence. However, the First Nations Forestry Program targeting log cabin and home construction is appropriate and holds some promise. further analysis on the extent and nature of the market, and existing competitors, would need to be undertaken before such a project could be recommended with some degree of confidence.

Secondly, we feel that there is an opportunity to expand the use of wood to heat commercial and institutional buildings, produce electricity, and perhaps manufacture synthetic fuels. Several technologies are commercially available for small-scale bio-energy generation, and more are under development. The use of wood pellets for heating individual buildings, including residences and institutional buildings, is widespread in rural areas. Co-generation could be combined with a sawmill to improve the economics of both ventures.

Tourism also provides a number of opportunities for Aboriginal people. Most of the tourism activities in the Yukon can be classed as ecotourism, and while other areas of the world have developed standards and marketing to emphasize the ecological interest and sustainability of tourism, the Yukon has been slow to adopt this approach. Ecotourism one of the fastest growing tourism sectors, and Arctic and Antarctic tourism is gaining tremendous interest. The Yukon has the resources to be competitive, but has not been effective at marketing itself in this way or put in place strategies, standards and the types of experiences that will draw more ecotourists.

Fourth, there are emerging market-based mechanisms for conserving ecological values, in addition to ecotourism, which was discussed above. Most appropriate for the Yukon would be direct payments to avoid or reduce development of ecologically significant areas – environmental groups and various NGOs realize that economic incentives are very powerful in inducing conservation, while on the other hand, there is little success to be had convincing people who have no other income alternatives not to exploit pristine areas. There are a variety of mechanisms and programs that have been put in place; this is a rapidly developing area that Aboriginal people should be tracking.

Finally, there are avenues for monetizing the benefits of activities that sequester carbon or avoid carbon dioxide emissions. While the future of the Kyoto Protocol is in doubt in Canada, and it has been rejected by the United States federal government, it is notable that many other countries are living up to their international promises, and many individual U.S. states and cities are adopting Kyoto-style targets. Many companies are also on board. There are a variety of avenues available for developing and selling carbon credits from forestry activities, and there are numerous other non-forestry opportunities available to First Nations communities that are very appealing: replacing fossil fuel use with geo-thermal, wind and solar power.

Underlying the recommendations associated with the opportunities identified above is a need for continued training. Training continues to be an appropriate theme of the First Nations Forestry Program in the Yukon, and the future Sustainable Communities Program of the Canadian Forest Service (CFS)/Natural Resources Canada (NRCan) also presents an opportunity to provide training and skills development. There are opportunities to increase the general level of capacity to develop and manage small businesses, to manage the forest resource, and to participate in the tourism sector.

The following is a summary of the recommendations contained in this report:

1. Explore the feasibility of developing the sawmilling capacity to supply the local market with lumber. This would entail developing a business plan, which would include an assessment of the local lumber market, how it could best be penetrated by a new entrant, and whether a new mill or expansion of an existing mill would be most attractive.

2. Continue log home construction training and assess the market for log homes.

3. The First Nations Forestry Program should develop mechanisms to provide more information about co-generation and other potential bio-energy projects to First Nations.

4. The First Nations Forestry Program should work with other Yukon and federal government departments to examine and perhaps fund a pilot co-generation project in the Yukon.

5. The First Nations Forestry Program should collaborate, or encourage the Council of Yukon First Nations (CYFN) to collaborate with organizations such as Tourism Yukon, the Tourism Association of the Yukon, or local colleges or universities to develop an appropriate introductory training course to support the entry of Aboriginal people into the tourism sector.

6. The First Nations Forestry Program should provide additional information regarding carbon emission offset credits.

7. The First Nations Forestry Program should support a pilot project, such as an afforestation project, to generate carbon emission offset credits.

8. Revise as appropriate the Model Forest proposal and submit it to the Sustainable Communities competition presently being held by the Canadian Forest Service/ Natural Resources Canada (this would have a strong training component);

9. Natural Resources Canada and Indian and Northern Affairs Canada should continue to fund the First Nation Forestry Program, or a similar program, to continue to provide training opportunities for First Nation people.

A one-day workshop was held on July 6 in Whitehorse, Yukon Territory to discuss the draft report and forest resource management in general. The discussion groups generated the recommendations in Table E1 (some of which have been made in this report), and prioritized them by voting on them. These recommendations are reproduced below.

Table E1. Prioritized Recommendations

	Recommendation	***# Votes***
Rec. 1	Timber harvesting for fuel, heating and locally oriented sawmill	*2*
Rec. 2	Continue to manage fish and game in a sustainable manner	*4*
Rec. 3	Explore Tourism opportunities.	*1*
Rec. 4	Explore carbon and biodiversity credits	*4*
Rec. 5	Continue skills development and training	*11*
Rec. 6	Consider pilot tests for co-generation facilities	*1*
Rec. 7	Communications with people in your traditional lands so they understand what is happening	*4*
Rec. 8	Revisit community Model Forest Program	*4*
Rec. 9	We need Land Use Plans prior to Forest Management Plans	*14*
Rec. 10	Manage Forest resources that enhance the use of and needs of Yukon people	*3*
Rec. 11	We should look at the health and safety for all communities	*1*
Rec. 12	Government should fund another workshop on co-generation and other wood/ energy sources	*5*
Rec. 13	Need to continue to have a Yukon FN Forestry Group that lets YFNs participate (whether they are a part of CYFN or not)	*16*

In recognition of the above chart, the participants identified the following top three recommendations that they would like to see prioritized, they are: Recommendations 13, 9, & 5.

In closing, the authors wish to thank the First Nations members who generously made themselves available for interviews and workshops related to this project, the staff of YTG who provided valuable information and insight, the workshop facilitators, and NRCan staff for their oversight and advice. The authors acknowledge Jack Smyth's contribution to this project and wish him an enjoyable retirement.

Overview of the Forest Sector, Opportunities, and Aboriginal Forestry in the Yukon Territory

1 Introduction

This project has been undertaken for the First Nations Forestry Program, a joint initiative of Natural Resources Canada (NRCan) and Indian and Northern Affairs Canada (INAC). The First Nations Forestry Program (FNFP) has been operating in the Yukon for ten years and its mandate is to support First Nations in the creation of sustainable communities and economic self-sufficiency.

There is a very strong Aboriginal presence in Yukon society, especially outside of Whitehorse, which is by far the largest centre in the Territory. The Territory also has a significant area of forest cover, and in the southeast the levels of productivity are high enough so that it would appear that the resource could support a viable forest products operation. As a result, the forest sector appears to offer opportunities for Aboriginal business and employment. However, the sector has been characterized by a number of unsuccessful efforts to establish sawmills, and currently, commodity production is limited to the production of rough timber by portable sawmills and a very small number of small scale, fixed sawmills. Moreover the Canadian forest sector is enduring a very difficult period so that conditions for the start-up of a new operation are generally unfavourable.

There have been numerous forest sector studies undertaken in the Yukon, ranging from wood supply studies to assessments of the cost structure and markets of a potential Yukon-based forest industry. Recent evidence, from studies as well as experience, suggests that the Yukon Territory may only be able to support a small wood products sector targeted primarily at local markets.

On the other hand, the relatively unexploited character of the forest offers the potential for a strong nature-based tourism experience, as well as the use of non-timber products. Furthermore, it is striking that in the Yukon, many of the First Nations communities, and likely many non-First Nations people living outside Whitehorse, obtain a very high proportion of their food supply from nature, including game, fish, berries and mushrooms. The contribution of the forest resource to the lifestyle and subsistence of Aboriginal people, as well as other rural inhabitants, is very significant from both an economic perspective, as well as a cultural perspective. As a result, in the present and foreseeable context, this study argues that the value provided by the forest resource would be greatest over the long term if it was managed primarily to maintain its non-timber and non-consumptive values. This approach does not exclude timber harvesting, especially for fire hazard reduction and salvage of mortality from the spruce bark beetle infestation. However, this study suggests that timber harvesting should use only a minor fraction of the maximum potential harvest level.

This report is intended to provide a snapshot of the current status of the Yukon forest sector, including both the industrial component as well as non-industrial and non-

commercial uses. Following a discussion of the Yukon demographic context, the report identifies key global trends in the forest sector and evaluates their import for the Yukon. Finally, the report provides an opinion regarding a future pathway for the forest resource and the utilization of the resource that appears to be well-suited to emerging and available opportunities and the interests of Yukoners.

1.1 The First Nations Forestry Program in the Yukon

All fourteen of the First Nations in the Yukon Territory participate in the FNFP. The Yukon component of the FNFP is unusual in that there is a local management committee that directs the program activities within the general framework of the FNFP. The Committee consists of representatives of each of the 14 First Nations[1], an NRCan staff member and a representative of the Yukon Territorial Government. There is also a coordinator who works part-time in Whitehorse. The Yukon FNFP five-year strategic plan is at its mid-point now – it commenced April 1, 2002 and runs until March 31, 2008.

The strategic plan identifies the goal of the FNFP as being the improvement of "economic conditions in status First Nations communities with full consideration of the principles of sustainable development". The four First Nations Forestry Program objectives, which are incorporated into the Yukon strategic plan are:

1. To enhance First Nations capacity to manage the forests sustainably;
2. To enhance First Nations capacity to operate and participate in forest-based development opportunities and benefits;
3. To advance knowledge in First Nations sustainable forest management and forest-based development; and
4. To enhance First Nations institutional capacity at the provincial /territorial level to support their participation in the forest-based economy.

The major areas of activity from 1996 – 2002 included fire suppression training and forest inventory and planning workshops. These were also identified as priority areas in the 2002 Strategic Plan. Annual reports from the program from 2002/03 to 2005/06 were reviewed. During this period, the following training initiatives were offered:

- Forest inventory data collection training was provided for eight people from seven communities (2002/03);
- Small Business Forest Development Ventures three-day workshop which was attended by roughly 100 participants from all 14 communities, and included non-Aboriginal participants and representatives of Yukon Territorial Government (YTG) and Forest Engineering Research Institute of Canada (FERIC) (2003/04);
- Log Cabin Building Training provided first-year (2004/05) training to nine participants from three communities (2004 – 06); and
- Morel Mushroom Workshop attended by 41 people (April – May 2005).

[1] The Kaska First Nation is not an official member of the FNFP however the Kaska representative participates as if an official member and is treated as an official member.

2 Overview of Yukon and First Nations Demographics

There are four primary sources of demographic information for the Yukon Territory:

- Statistics Canada census data, which are collected every five years;
- Yukon Territorial Government data, provided monthly;
- Estimates of Yukon First Nations populations made by Indian and Northern Affairs Canada in 2005 and reported in 2006; and
- Information provided by the First Nations themselves.

Of these sources, the consultants have relied on the Yukon Government data to profile the territorial and community populations. This is because the Yukon Government data are up-to-date and assumed to be accurate because the updating takes place regularly and the assessors are anticipated to have a very good local knowledge. In contrast, the most recent Statistics Canada census took place in 2001 and while these data will be referenced, they are not used here as a basis for drawing conclusions.

The INAC (2006) data are the only set of consistent community-specific estimates that was found regarding the population levels of the First Nations, and these data are used in the discussion of First Nation demographics. The First Nations populations are presented in terms of total membership. These data are useful for different purposes. First Nations members living on their traditional territory are the primary target group for the FNFP. Many who live off-reserve live in Whitehorse and are likely to travel to their traditional territory during the year to visit, hunt, fish, gather berries, or for other reasons.

The First Nations that we interviewed for this project also provided an assessment of their populations. These were useful in providing general guidance.

2.1 Territorial and Whitehorse Population

The population for the Yukon Territory has been rising since its recent low point in 2003. As of December 2005, the territorial population stood at 31,587. The population during 2005 averaged 31,240, a 2.0% increase from the 2004 level of 30,627. Population levels over the last seven years are shown in Table 1, including the percentage rate of change from year to year. The Statistics Canada census data suggest a rather different situation – StatsCan assessed the 2001 Yukon population as 28,674, a decline of 6.8% from the level in 1996 (30,766 people). The 2006 census will likely catch the recent uptrend, but results will not be available until 2007 at the earliest. In contrast, the territorial data shows roughly 2,500 more people in the territory in both 1996 and 2001; and an 8.4% decline between those two years.

The main driver for population change in the Yukon is migration. Since 1998, births have ranged between 350 – 400 per year, and deaths from 130 – 160 per year, for a net increase of roughly 200 people per year (YTG 2005a). In contrast, gross in-migration ranged from 1,200 to 1,500 people per year between 1998 and 2004, while gross out-

migration has ranged from 1,100 to 2,700 per year during the period. There has been net out-migration in all years since 1997, except for 2003 which saw a gain of 316 people. The greatest outflows occurred during the 1997 – 2000 period, when they were generally about 500 - 600 people/ year (the exception was outflow of 1,111 in 1998).

The majority of Yukoners live in Whitehorse; Table 1 also provides demographic data for Whitehorse and for the remainder of the Territory. These data are graphed in Figure 1. Figure 2 shows the year over year percentage change in populations. In general, Whitehorse lost proportionally fewer people than the Territory as a whole during periods of population decline, and gained more when populations were rising. The year 2005 was a notable exception.

Table 1. Yukon Population Data.

Year	Yukon	y-o-y % change	Whitehorse	y-o-y % change	Yukon excl Whitehorse	y-o-y % change
2005	31240	2.0	23511	1.3	7729	4.1
2004	30627	2.2	23205	4.5	7422	-4.3
2003	29967	-0.3	22213	0.1	7754	-1.5
2002	30063	-0.7	22192	-1.3	7871	1.0
2001	30273	-1.6	22476	-1.2	7797	-3.0
2000	30776	-1.3	22738	-0.8	8038	-2.6
1999	31166	-3.3	22917	-2.1	8249	-6.4
1998	32216	-3.9	23406	-2.6	8810	-7.3
1997	33519	1.4	24018	1.7	9501	0.7
1996	33051		23611		9440	

(Source: YTG 2005a, YTG 2005b)
Note: y-o-y = year over year

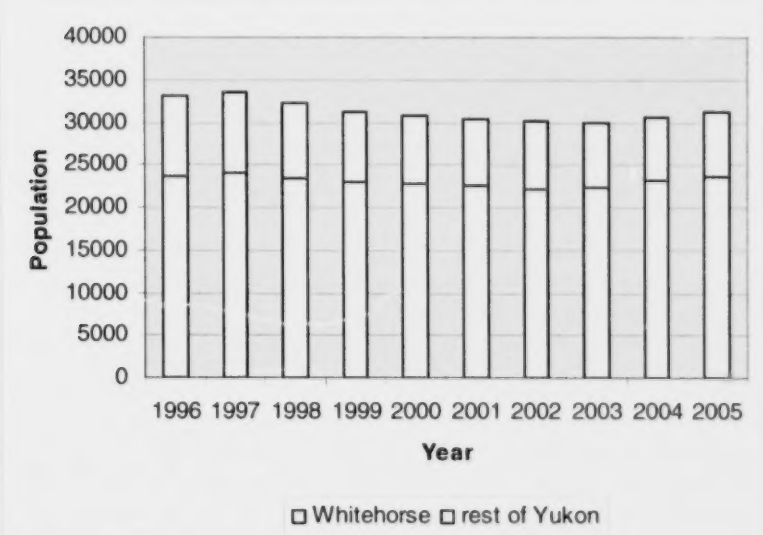


Figure 1. Population in Whitehorse and rest of Yukon, 1996-2005.

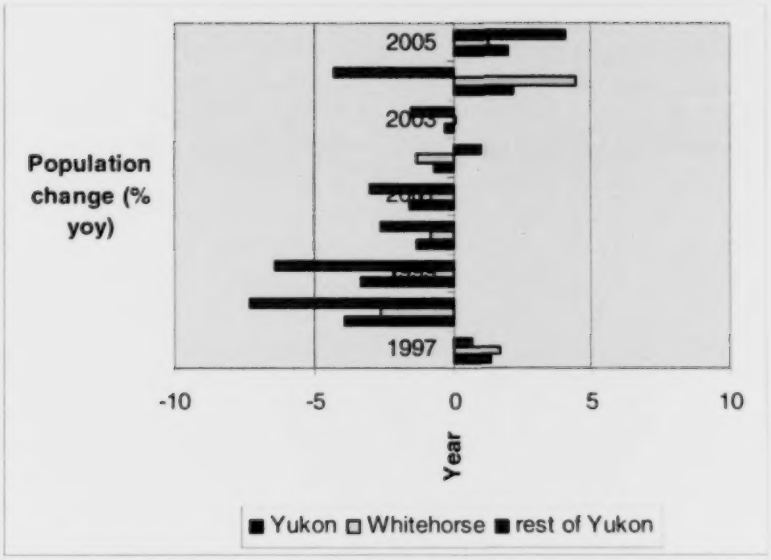


Figure 2. Year-over-year (y-o-y) population changes in the Yukon, Whitehorse, and Yukon ex Whitehorse.

In 2005, 75% of the Territorial population resided in Whitehorse, compared with 71% in 1996. However, population changes in Whitehorse have mirrored the overall direction of change in the Territory as a whole. Statistics Canada again appears to underestimate the population of Whitehorse; census records show a population of 21,405 in 2001 and a population of 21,808 in 1996.

Table 1 indicates that the "rural" or non-Whitehorse population of the Territory declined more markedly during the 1996-2005 period than the Whitehorse population. During this period, the rural population fell by 18%. This is shown clearly in Figure 1 and Figure 2, which show the actual population numbers between 1996 and 2005, and the year over year percentage changes.

Both YTG and Statistics Canada census provide a count of people of Aboriginal identity. Statistics Canada estimated in 2001 that there were 6,540 people of Aboriginal identity in the Territory, or 23% of the total population. Of these, 3,305, or just over 50%, lived in Whitehorse. This implies that the remaining 3,235 lived in smaller communities and represented 41% of the rural population. These figures are quite close to those available from YTG, whose data for June 2005 showed a total of 7,018 Aboriginal people in the Territory. This is equivalent to 22% of the Territorial population.

INAC also provides First Nations census data. As of December 2005, INAC reported that there were 8,073 status Indians living in the Yukon Territory (INAC 2006). However, this number included 165 people in the Dease Lake First Nation, and 371 people in the Taku River Tlingit First Nation, both of which have most of their territory in B.C. When these people are excluded, the INAC estimate is 7,534. Another

difference between the YTG and INAC data is that the INAC data include First Nations people living in other provinces or outside Canada. This explains why the INAC figure is higher than either of the YTG or StatsCan figures.

2.2 Smaller Yukon Communities

As indicated above, the smaller communities have generally borne the brunt of the Yukon population declines. Table 2 shows population data for the communities with more than 375 people. Most of these saw small population increases during 2005 but experienced, in aggregate, a 16% decline from 1995 to 2005, with the majority of it occurring between 1995 and 2000 (when the decline was 11%).

The greatest decline occurred in Faro, where a mine was opened in the mid-1990's and then closed later that decade. Faro's population rose from 528 in 1994 to 1,312 in 1996, before declining to 431 in 2000. The greatest declines occurred in 1998 and 1999, when there were very high out-migration levels from the Territory. Of the communities shown in Table 2, Haines Junction and Carcross have fared best, recording population increases between 1995 and 2005.

Table 2. Population Data for Yukon Communities with 375 – 2000 people.

Year	Carcross	Carmacks	Dawson City	Faro	Haines Junction	Mayo	Teslin	Watson Lake
2005	446	408	1827	391	824	400	408	1544
2004	442	392	1811	363	789	386	419	1547
2000	417	428	1928	431	754	457	446	1657
1995	421	477	1995	823	802	485	466	1775
2004-2005	0.9%	3.9%	0.9%	7.2%	4.2%	3.5%	-2.7%	-0.2%
2000-2005	6.5%	-4.9%	-5.5%	-10.2%	8.5%	-14.3%	-9.3%	-7.3%
1995-2000	-1.0%	-11.4%	-3.5%	-91.0%	-6.4%	-6.1%	-4.5%	-7.1%
1995-2005	5.6%	-16.9%	-9.2%	-110.5%	2.7%	-21.3%	-14.2%	-15.0%

(Source: YTG 2005a, YTG 2005b)

The situation is different in the very small communities with fewer than 375 people (Table 3), which (excluding Marsh Lake) have recorded an aggregate 2% increase in population between 1995 and 2005, and a 3.8% increase between 2004 and 2005. Of these, Beaver Creek and Ross River have fared worst, experiencing declines throughout the period, whereas Tagish has gained substantially. The other communities have generally remained static. Marsh Lake is a newly created community on the outskirts of Whitehorse, which is why it did not appear in the population listings until 2003.

The First Nations population is generally considered to have a relatively high fertility rate, but this does not show up in the general demographic data. Most of the small communities - Beaver Creek, Burwash Landing, Old Crow, Pelly Crossing, Ross River,

Tagish – are the centres of First Nations (see Table 4), and while the communities also include non-Aboriginal people, the populations do not show a consistent rate of increase. Of the communities shown in Table 2, all except Faro are identified as the main communities of First Nations.

Table 3. Population Data for Yukon Communities with Fewer than 375 people.

Year	Beaver Creek	Burwash Landing	Destruction Bay	Marsh Lake	Old Crow	Pelly Crossing	Ross River	Tagish
2005	111	85	56	364	267	291	354	194
2004	114	79	56	300	262	278	336	182
2000	126	81	46		287	289	366	166
1995	138	79	48		270	291	379	126
2004-2005	-2.7%	7.1%	0.0%	17.6%	1.9%	4.5%	5.1%	6.2%
2000-2005	-13.5%	4.7%	17.9%		-7.5%	0.7%	-3.4%	14.4%
1995-2000	-9.5%	2.5%	-4.3%		5.9%	-0.7%	-3.6%	24.1%
1995-2005	-24.3%	7.1%	14.3%		-1.1%	0.0%	-7.1%	35.1%

(Source: YTG 2005a, YTG 2005b)

The Territorial population medium growth projection assumes no net migration and anticipates a 5.2% increase in Aboriginal people between 2005 and 2015, versus a 4.2% increase in non-Aboriginal people during the same period (YTG 2005c). It thus appears that the fertility rate of Aboriginal people is only slightly higher than that of non-Aboriginal people in the Yukon.

2.3 Yukon First Nations

There are fourteen First Nations that live throughout the Yukon Territory. Table 4 summarizes key relevant descriptive information, and Figure 3 shows the location of the traditional territories. Note that many of the traditional territories partially overlap.

Figure 3. Map of traditional territories.

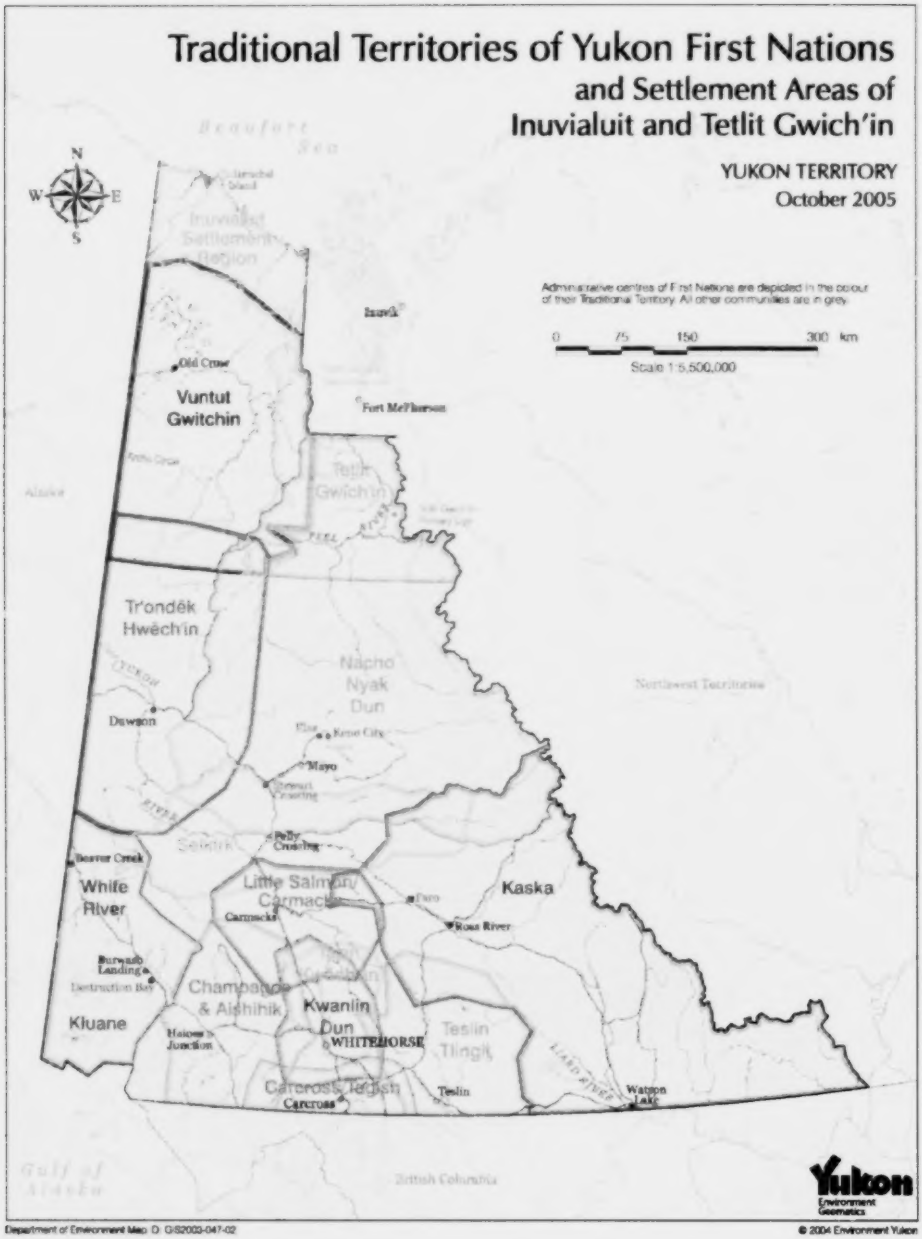


Table 4. General Information Concerning Yukon First Nations.

First Nation	Population (INAC 2006)	Main Community	Year of Settlement	Area of Settlement Land (sq km)	Language	Tribal Council
Carcross/ Tagish First Nation	596	Carcross	2005	1554	Tagish, Tlingit	
Champagne and Aishihik First Nations	740	Haines Junction	1993	2396	Southern Tutchone of Athabaskan Descent, Tlingit	Southern Tutchone Tribal Council
Kluane First Nation	138	Burwash Landing	2003	907	Southern Tutchone of Athabaskan Descent, Northern Tutchone, Kutchin	
Kwanlin Dun First Nation	959	Whitehorse	2005	1036	Northern and Southern Tutchone, some Tagish	
Liard River First Nation	1032	Watson Lake	No agreement has been reached	4740	Kaska of Athabaskan Descent	Kaska Tribal Council
Little Salmon/Carmacks First Nation	572	Carmacks	1997	2590	Northern Tutchone of Athabaskan Descent	Northern Tutchone Tribal Council
First Nation of the Nacho Nyak Dun	461	Mayo	1993	4740	Northern Tutchone of Athabaskan Descent	Northern Tutchone Tribal Council
Ross River Dena Council	459	Ross River	No agreement has been reached	4714	Kaska of Athapaskan Descent	Kaska Tribal Council

Selkirk First Nation	500	Pelly Landing	1997	4740	Northern Tutchone of Athabaskan Descent	Northern Tutchone Tribal Council
Ta'an Kwäch'än Council	221	Lake Leberge Reserve #1	2002	777	Southern Tutchone	n/a
Teslin Tlingit Council	545	Teslin	1993	2396	Tlingit	Daak Kaa Tlingit Nation
Tr'ondëk Hwëch'in First Nation	671	Dawson City	1998	2590	Han	
Vuntut Gwitchin First Nation	506	Old Crow	1993	7744	Kutchin of Athabaskan Descent	
White River First Nation	136	Beaver Creek	Agreement initialed in 2002 but not ratified	518	Upper Tanana	
TOTAL	7536			41442		

Table 4 also shows the main community where the majority of members reside, within their traditional territory. There are only four reserves in the Yukon Territory – Lake Laberge #1, Carcross #4, Champagne Landing #10, and Teslin Post #13.

There have been extensive political discussions that led, in 1993, to the signing of the Umbrella Final Agreement (UFA), between the Government of Canada, the Yukon Territorial Government and the Council of Yukon First Nations, which was a body set up to represent the First Nations during settlement negotiations. The Council of Yukon First Nations (CYFN) has continued to exist since the agreement was signed.

The UFA provided the framework for the negotiation of settlements, and since the completion of the UFA, eleven of the First Nations have reached a final agreement. A twelfth, White River First Nation, initialed its agreement in 2002, but has not proceeded to a ratification vote. Ross River Dena Council and Liard River First Nation have not yet reached agreement, and there is a complicated series of reasons why this has not happened. The UFA identified three classes of settlement lands[2]. This is explained in more detail in section 5.0.

In Table 4, the year of settlement represents the year that the individual settlement agreement came into effect, and the amount of settlement land includes land in all three categories.

Table 5 provides more detailed information on where First Nations people live. For the First Nations, the notion of population has several different scales. The population data reported by INAC[3] includes only people who are on the Indian Register, and does not include those who are eligible but have not registered.

Table 5 shows the number of registered First Nation members who live on reserve, those who live on Crown land, and those who live off-reserve. These three classes are mutually exclusive. Because there are few reserves in the Yukon, a low percentage of the population lives on reserve. However, this category also includes members of one community living on the Reserve of another community, anywhere in Canada. The Crown land residents also include those who live on the settlement lands. Lastly, the off-reserve category includes members both within and outside the Yukon who live outside of a reserve and not on Crown land.

According to INAC, only the Carcross /Tagish had a significant number of people (120 people) living on their reserve (and 3 living on other reserves), for a total of 20% of the population. The Liard River First Nation also has a considerable number of people living on reserve: 148 people or 14% of their population. Lake Laberge #1 is shown as the main community of the Ta'an Kwäch'än and INAC indicated a population of only 22, but this represented 10% of the community (in addition, one person lived on another reserve). For the other First Nations in the Yukon, the proportion of people living on reserve (usually other First Nations' reserves) is generally between 1 and 2%.

[2] http://www.gov.yk.ca/depts/eco/landclaims/faq.html accessed April 4, 2006.
[3] Available at http://www.ainc-inac.gc.ca/pr/sts/index_e.html#Population.

However, the INAC data are quite different from other sources. The INAC registry reports that there are 958 registered Indians living on reserve; of these, 849 or 89 % live on their own reserves. In contrast, Statistics Canada 2001 census data report 1,835 registered Indians on reserves and in northern communities in the Yukon.

Table 5. Location of residence of First Nation Members.

First Nation	On Reserve	On Crown land	Off Reserve	TOTAL	% on reserve	% on Crown	% on res or Crown	% off reserve
Champagne & Aishihik	10	329	401	740	1.4%	44.5%	45.8%	54.2%
Carcross/ Tagish	123	113	360	596	20.6%	19.0%	39.6%	60.4%
Nacho Nyak Dun	1	162	297	460	0.2%	35.2%	35.4%	64.6%
Kluane	2	67	69	138	1.4%	48.6%	50.0%	50.0%
Kwanlin Dun	18	638	303	959	1.9%	66.5%	68.4%	31.6%
Liard	148	339	545	1032	14.3%	32.8%	47.2%	52.8%
Little Salmon/Carmacks	2	290	280	572	0.3%	50.7%	51.0%	49.0%
Ross River	2	322	135	459	0.4%	70.2%	70.6%	29.4%
Selkirk	6	289	205	500	1.2%	57.8%	59.0%	41.0%
Ta'an Kwach'an	23	85	113	221	10.4%	38.5%	48.9%	51.1%
Teslin Tlingit	4	249	292	545	0.7%	45.7%	46.4%	53.6%
Tr'ondek Hwech'in	7	183	481	671	1.0%	27.3%	28.3%	71.7%
Vuntut Gwitchin	6	259	241	506	1.2%	51.2%	52.4%	47.6%
White River	3	45	88	136	2.2%	33.1%	35.3%	64.7%
TOTAL	355	3370	3810	7535	4.7%	44.7%	49.4%	50.6%

(Source: INAC 2006)

There are some disparities between INAC's data and the information we have received from some of the First Nations. For example, the Champagne and Aishihik First Nations indicated that they have roughly 1,200 members, about half of whom live in the Yukon Territory. Of these, about half live in Whitehorse and half on the traditional territory. In contrast, INAC statistics report a total community population of 740, of which roughly half live off-reserve and the remainder on Crown land.

Between 2000 and 2005, according to INAC records, the population of the Yukon First Nations increased from 7,019 to 7,535, an increase of 7.4%. The populations of all 14 First Nations increased, with gains ranging from 4 people (or 0.4%) in the case of Kwanlin Dun to 131 (21.5% increase) in the Champagne and Aishihik First Nations. This exceeded the overall rate of Territorial population increase, suggesting that if these rates of increase applied to the portions of the populations living in the Yukon, that the First Nations proportion of the Territorial population increased during this period.

The period also saw a slight shift in the location of residence, with an increase in the proportion of people living off-reserve from 47.3% in 2000 to 50.6% in 2005. This shift

came primarily at the expense of the on-reserve population, since the Crown land residents made up a similar proportion of the total populations in both years.

3 Key Trends

3.1 Global Trends

There are various ways to analyze global trends in the forest products sector. Various agencies of government, ENGOs and industry groups all have their own perspective. We think that one rather broad list from Price Waterhouse Coopers highlights six trends that will drive sustainable development (PWC 2005b).[4]

Growing influence of global market forces, rather than government policy

The influence of the markets in decision-making will grow as they reflect rising demand, shrinking supply, and changing patterns of demand for natural resources. While demand for forest products in North America has remained relatively flat, it has increased dramatically in Asia, particularly in China (Sedjo 2005, Sun 2004). The shrinking supply for many commodities, with the notable exception of wood fibre, has increased their prices. Rising energy costs are particularly relevant for the forest sector.

Revisions in the financial model used to set corporate and government strategy

The new model will include new scenarios, new risk factors, and a growing number of intangible and non-financial factors. There are new scenarios because of the need to respond to rapidly changing conditions, such as the rise in consumption in India; new risk factors such as climate change which has spawned initiatives such as the Carbon Disclosure Project for the private sector, and a growth in intangibles such as a demand for the private sector to participate in social issues such as poverty alleviation.

Innovations, particularly in core industries

Rapidly changing economic conditions are expanding the rate of innovation exponentially to include changes in corporate and public sector behaviour, product design, supply chains and geopolitical structure. In addition the role of technology will continue to gain in prominence.

Globalization – Changing roles of local institutions

International institutions will be responsible for formulating many new global policies. These policies are governmental, non-governmental and corporate policies developed through a host of new institutional arrangements.

The national or local institutions' primary role will be limited to implementation of those policies. This trend applies to both developing and developed countries.

[4] A similar set of driving forces were identified in a recent report on the BC Forest Sector (Bull and Williams 2006).

Evolution, not revolution

Progress toward sustainable development will be largely incremental. Barriers to rapid change will die hard, but specific catalysts may cause spurts of great change. For example, the World Business Council on Sustainable Development is spawning a number of initiatives that are stimulating great change and will directly impact the forest products sector.

Communication

We are in the midst of a global communication revolution affecting every area of our lives. The global media may influence which issues governments and industries focus on and accelerate the speed of changes in policy and behaviour.

The factors listed above are leading to shifts in both the production and consumption of forest products throughout the world, and the result has been a decrease in the Canadian sector's competitiveness.

For several years, business headlines have drawn attention to the long-term high growth that China has sustained, and its emergence as a major competitive force in many industrial sectors. In the global forest sector, the rapid growth of China has led to major re-adjustments over the past ten years. While growth in China captures most of the headlines, economic growth has accelerated in India, Brazil and Russia, so that for the first time, world economic development is being led by countries not in the Organization of European Economic Community (non-OECD countries). In 2005, the emerging economies produced slightly more than half of the world's output and for the first time, accounted for more than half of the increase in global output (Economist Jan 21-27 2006).

The so-called BRIC countries (Brazil, Russia, India and China) are responsible for much of the non-OECD growth, and developments in China and Russia are of particular relevance, given their relative proximity to the Yukon. In the forest sector, Russia and Brazil are potential and existing competitors, respectively, China may be a competitor in some product areas and a consumer in others, while India does not have extensive plantation areas or exploitable natural forest, and so its economic development will lead to an increase in its consumption of forest products.

Brazil in particular already has a technologically sophisticated forest products sector, supported by relatively low costs and rapid plantation growth rates. China is rapidly gaining technological expertise but has domestic wood supply issues that it has partially addressed by importing wood fibre. Russia has a vast resource, but lacks infrastructure and an institutional framework at this point to become a serious competitor. However, large volumes of wood from the Russian Far East are already making their way to Chinese processing plants and European forest companies are very active in western Russia, so indirectly, the use of its resource is beginning to have a global impact.

A recent report by White et al. (2006) states that the value of Chinese imports of wood increased from $6.4 billion in 1997 to $16.4 billion in 2005, and that the annual volume

of imports rose from 40 million m^3 to 143 million m^3 of roundwood equivalent during the same period. While this increase in imports has partially reflected increased domestic demand for forest products, the composition of imports has shifted from processed wood products to raw timber.

Chinese forest product industries have enjoyed almost exponential expansion – plywood production rose from 2.6 million to 21 million cubic metres from 1994 to 2004, with China becoming a net plywood exporter in 2001 (White et al 2006). Similar shifts have also occurred in pulp and paper production. These shifts reflect China's emergence as the low-cost production of the world, and exports of Chinese manufactured wood products to the EU and US increased by 700 – 900 percent between 1997 and 2005. Exports are presently equivalent to 70% of the imported volume of timber. These trends are expected to continue - White et al (2006) estimate that wood imports are likely to double over the next decade, and continue to increase for as long as several decades.

With India also growing at a rapid clip, and Brazil and Russia poised to follow, the global flows of timber and forest products can be expected to undergo substantial shifts in the next decades. Demand for timber and forest products will certainly increase, but it is not clear how this will translate into supply and price impacts, since plantation development in the southern hemisphere is counteracted by natural forest depletion, including significant illegal and unreported harvests. Most of these macro-trends are directly impacting the Canadian forest sector, and this is the topic of the next section of the report.

3.2 Canadian forest sector trends

The Canadian forest products sector is facing numerous challenges in maintaining its share of the forest products markets. The current primary challenges identified by various experts, government committees and industry associations (Wood Products Industry Advisory Committee 2006, FPAC 2005, Roberts 2005) are:

- rising exchange rate;
- increase in global competition driving a long term price decline and industry consolidation;
- comparatively heavy tax burdens from all levels of government;
- trade barriers;
- subsidies; and
- higher factor costs (energy, fibre, technology and labour).

Some of these issues are the direct flow through of broad global issues into the national sector, while other national issues have been exposed as a result of larger trends (e.g. government tax burdens were not so onerous when industry was more profitable).

This next section of the report will highlight some of these issues and discuss their implications for Canada.

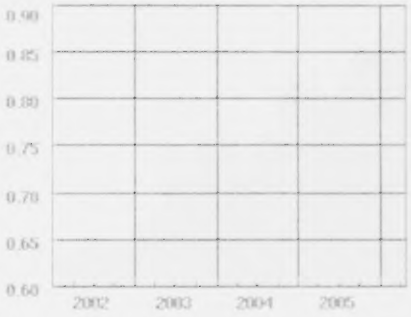
Additional Canadian sector trends such as changing sources of industrial wood supply, setting management's strategic focus, product differentiation and branding, attracting skilled labour, and leveraging regional attributes are also mentioned as very important issues Canada will have to address in moving forward, but we did not cover these in this report since they not as strongly linked to the report objectives (BC Wood Products Industry Advisory Committee 2006).

3.2.1 Exchange rates

Because the majority of Canada's forest products are exported to the United States, Canada's forest products industry has been severely impacted by the rise of the Canadian dollar against the American dollar. Figure 4 depicts the rise in the Canadian dollar since its low point of 0.6199 US $/Cdn $ on January 18th, 2002.

Figure 4. Recent Canadian – US exchange rate history

US dollars per Canadian dollar



Source: Bank of Canada 2006

Table 6 summarizes the exchange rate history since 1996. The average exchange rate has been $US 0.7144 for each $1CDN in the 10-year period from 1996 to 2006. Since early 2006, the rate has frequently been greater than $US 0.90 for each $1CDN, representing a rise of 45% since the low of January 2002.

Table 6. Recent Canadian – US exchange rate history (US noon dollar rate)

Date	Date / Time Period	Exchange Rate
Low [high]	**11/05/2006**	**1.0990** [0.9099]
Average	**02/01/1996 — 11/05/2006**	**1.3997** [0.7144]
High [low]	**18/01/2002**	**1.6132** [0.6199]

Source: Bank of Canada 2006

Price Waterhouse Coopers estimates that each one cent rise in the value of the Canadian dollar reduces revenues in the Canadian forest products industry by over $500 million.

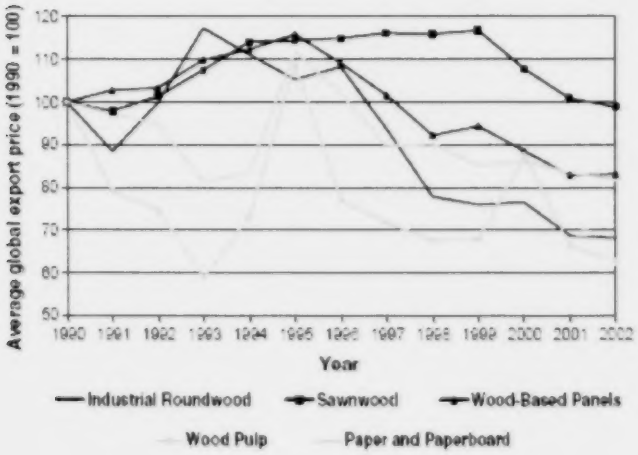
Accordingly, exchange rate changes from January 2002 to April 2006 represented a reduction in revenues of nearly $13 billion dollars!

The Forest Products Association of Canada (FPAC) has argued that the export intensity of Canada's forest products industry combined with the fact that all of its major inputs—fibre, energy and labour—are sourced in Canada makes it among the most vulnerable to exchange rate shocks. It comes as no surprise then that FPAC suggests that the Canadian monetary authorities must employ what discretion they have to manage the appreciation of the Canadian dollar. The competitive pressures created by the surging dollar also lend renewed urgency to the need for policy reforms in other areas to improve the business climate for the forest products industry and other export-oriented manufacturers.

Canada's share of U.S. imports has dropped by 12 percentage points since 1990, from 74% to 62%. Clearly, other exporters are gaining ground. Set against the growing market for forest products, the evidence suggests that Canada is not keeping pace. Part of the explanation for the decline is the exchange rate

3.2.2 Competition and its Impacts

In 2005, FPAC released a policy paper, Competition and Consolidation in Canada's Forest Products Industry, outlining the industry's views on Canada's industrial, trade and competition policy framework. The increased competition from new offshore producers presents a more challenging environment for the Canadian forest products industry and the evidence is found in decreasing product price changes and in the level of consolidation in the global industry. Consolidation in turn further drives product price reductions by creating efficiencies, removing high cost capacity, and improving the access to capital markets by forest products companies.

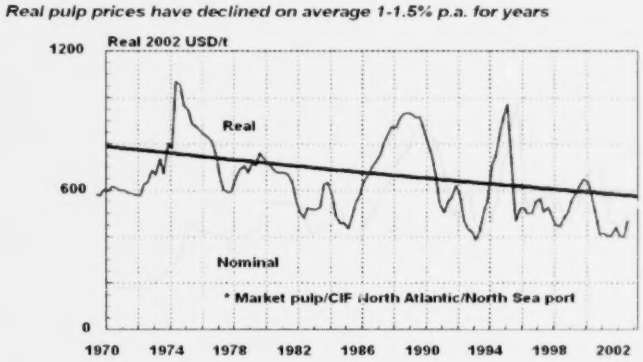


Source: Bull et al 2005

Figure 5. Recent trends in global forest product export prices

Figure 5 indicates that global export prices for forest products have steadily declined since 1995. While Canada attempts to seize opportunities in the global market, it is also struggling to maintain share of its largest market - the United States (FPAC 2005).

As a more specific example of price trends, let's review the pulp sector. Figure 6 indicates that in North America, real pulp prices have experienced a decline of 1-1.5% per year since 1970. The situation is similar in Europe.



Source: Parsonson 2005; Sample V.A. 2005

Figure 6. Real pulp price in North America.

In contrast, as indicated in Figure 7, the index of primary commodity prices indicates a very positive price trend in real terms since 1995. Thus the investment community has directed its attention to these other primary commodities, making it very difficult to raise investment capital for forestry projects.

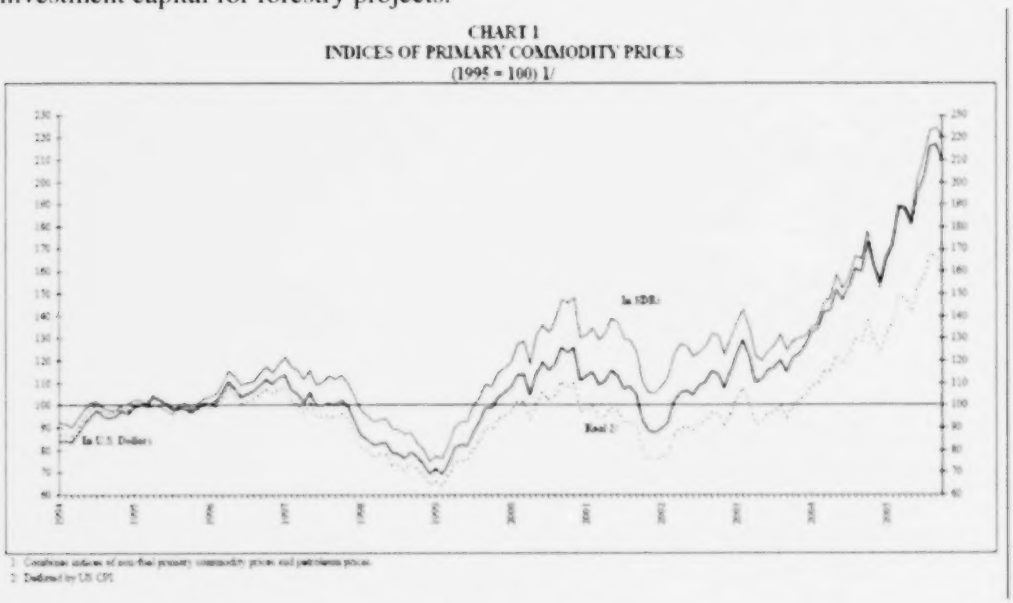
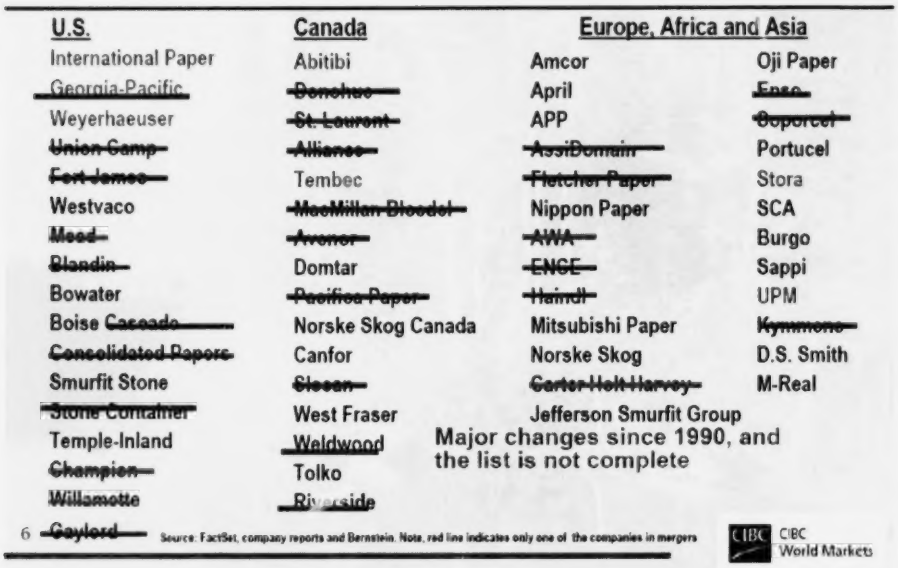


Figure 7. Indices of Primary Commodity Prices.

These price trends have created a negative business climate for the forest products sector. Even if you had a low cost of fibre and production, you may still suffer from a poor investment climate. Capital markets may consider risks too big to invest in capacity expansion in North America.



Source: Roberts 2005.

Figure 8. Changes in the composition of the forest sector since 1990.

Between 1998-2004, the average rate of return on capital employed (ROCE) in the Canadian forest products sector was 4.4 %; in contrast, the rate in Latin America was 7.3% during the same time period. Today, the average cost of capital is between 10-13% and globally, only the very best forest products companies have been able to achieve an equivalent ROCE (Roberts 2005).

Therefore, it is not surprising to see a significant change, as illustrated in Figure 8, in the number of forest products companies in many regions where consolidation is the norm, as industry seeks to find new efficiencies.

3.2.3 Taxes

There have been numerous calls for a Canadian tax system that is more competitive. At the federal level for example, some are calling for provisions to expense investment as soon as it occurs in order to compete with some US federal initiatives (FPAC 2005). Other industry groups are petitioning for an overhaul of the municipal tax structure to make them more competitive (BC Wood Products Advisory Committee 2006). Finally there is the continued tinkering with provincial tax structure (e.g. stumpage; corporate tax, small-business tax) to find a way for the industry to be competitive.

Taxation is a very complex topic and it is very difficult to provide a short summary of the possible scenarios which constitute a competitive tax system; nonetheless it is a fundamental issue to the sector.

3.2.4 Trade

There are also tariff and non-tariff trade barriers in emerging markets. FPAC and others argue for a strong trade policy approach to remove barriers to trade and improve the framework for investments, through multilateral initiatives like the Doha Round of the World Trade Organization (WTO) and bilateral discussions with individual governments.

Industry negotiators from Canada, the United States, New Zealand, as well as observers from the EU and Malaysia, held meetings with the WTO to urge them to reduce tariff and non-tariff barriers on forest products as part of the WTO's Doha round. Negotiators were receptive to the industry's concerns, particularly the issue of reducing tariffs for wood and paper products.

The recent softwood lumber trade dispute with the United States substantially weakened the Canadian forest sector, and the solution, while it brings resolution to the dispute for a period of five years, also represents an acknowledgement that the dispute mechanism of NAFTA has been ineffective. This weakens Canada's long-term negotiating position.

As with taxation, trade is a very complex topic but we raise it as a fundamentally important issue which will continue to have a direct effect on the Canadian forest sector.

3.2.5 Subsidies

FPAC has argued that there has been aggressive competition from low cost international producers in global markets. Some of the chief competition has come from countries with extensive areas of industrial plantations. Of concern to Canadian producers is the extent of direct subsidies supplied to the producers. Table 7 summarizes some of the available statistics on the level of these direct subsidies. The table shows the calculated total amount of the subsidy, expressed in US dollars, the amount adjusted for inflation to 2003, and the average annual inflation adjusted subsidy rate in 2003 dollars. Note in particular the extent of direct subsidies in China, Indonesia and Malaysia, important potential markets for Canadian forest products.

In some cases, direct subsides (e.g. grants, loans, and equity infusions) are just the 'tip of the iceberg'. In order to avoid possible violation of trade agreements, some countries have used other types of subsidies. According to the WTO (1994), subsidies are also deemed to exist if there is a financial contribution by government or any public body where the government practice involves:

- Potential direct transfers of liabilities (e.g. loan guarantees);
- Government revenue that is otherwise due but is foregone (e.g. tax exemptions);
- Government provision of goods or services other than general infrastructure;

- Government payments to a funding mechanism or direction to a private body to carry out any of the foregoing functions.

Table 7. Direct subsidies levels in most important industrial plantation countries.

Country	Subsidy [million US$]				
	Not adjusted	Adjusted for Inflation*	Period reported	Average annual subsidy [million US$]	Source
China	759.0	809.3	1985–2000	53.95	(Sun, 2000)
India	–	–	–	–	–
United States	200.0	241.0	1974–1994	12.05	(Gaddis et al., 1995)
Indonesia	425.0	440.6	1984–2001	25.90	(Barrett, 2001)
Brazil	7.0	7.3	2001	7.30	(USDA Foreign Agricultural Service, 2001a)
Thailand	–		2001	–	(USDA Foreign Agricultural Service, 2001b)
Chile	174.6	196.7	1974–1997	78.60	(Freese, 1998)
Malaysia	263.0	263.0	2002	263.00	(Sunetman, 2003)
New Zealand	3.0–4.2	3.1–4.4	1908–2001	0.03–0.05	(Rhodes and Novis, 2002)
	30.4	192.0	1950–1959	19.20	
Australia	–	–	–	–	–

* Historic inflation rates provided by the Federal Reserve Bank of Minneapolis (2003) were used.

Source: Bull et al 2005.

So, in the Canadian context, if subsidies of various sorts are still being handed out, there is every indication that this is a contributor to long term decline in real prices and to the ability of the provinces and territories with extensive natural forest to compete.

3.2.6 Factor costs

Energy

Energy costs in Canada are subject to global forces. Canadian energy use is dominated by the consumption of refined petroleum products, followed by natural gas, and then electricity. A variety of other energy sources make up the rest of Canadian energy supply, including liquefied petroleum gas, coke and coke oven gas, residential wood, coal, and steam. Most of these fuels are non-renewable, with the exception of hydroelectricity. Canadian demand for energy products has risen over the past few decades. One of the primary increases in energy demand is related to the transportation sector, as shown in Figure 9. Another area of energy demand is for residential and commercial heating and electricity generation; while this has declined in the southern portions of Canada, the northern territories still rely heavily on liquid fuels for heating and power production.

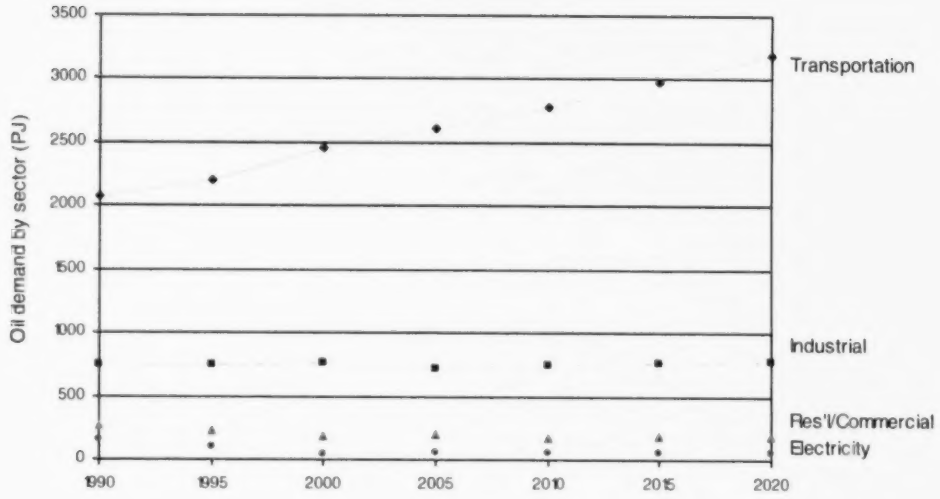


Figure 9. Canadian oil demand by end-use sector.

Source: NRCan (2000) Canada's Emissions Outlook Update 1997-2020.

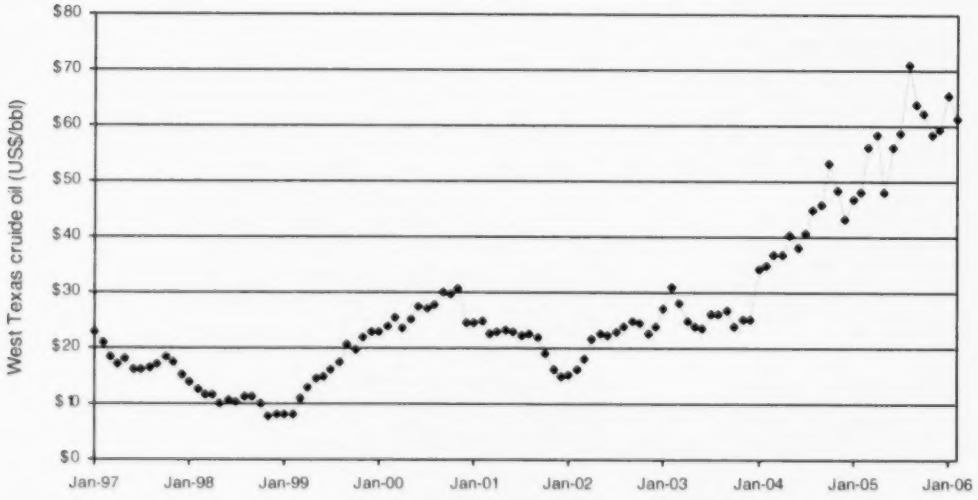


Figure 10. Monthly cost per barrel of West Texas Intermediate crude oil (US$/bbl).

Source: www.economagic.com

As Figure 10 shows, the increasing price of oil has been matched by heightened volatility. Swings of over $10 per barrel within a matter of weeks are now quite common, creating uncertainty in the fuel market. Some of this volatility comes from

conflict and uncertainty in the oil-producing nations of the Middle East, while some price swings can be related to natural disturbances and financial events (e.g. hedge fund activity). The global nature of the petroleum industry means that these swings have impacted consumers in Canada, even though this country is a net exporter of petroleum, and has benefited from higher prices in terms of balance of trade and GDP.

While less volatile, electricity costs in Canada have also been rising, with recent reports from the Ontario government estimating that average delivered prices will rise to about $75/MWh by 2009, from about $55/MWh today. These prices reflect a market primarily supplied by hydroelectric, coal, and nuclear power. Alternative energy sources, including bio-energy, geothermal, solar, and wind power are only available at the demonstration stage and are currently a more costly alternative to traditional energy sources.

While rising, Canadian energy costs are still relatively low in the global market; the abundance of this inexpensive energy has provided little impetus for bio-energy development. Several provincial incentives for bio-energy producers exist; in BC, for example, green tenders offering a fixed price of $55/MWh have been provided to alternative energy producers, which includes $8/MWh worth of credits. The Federal government offers several programs, including the Renewable Energy Deployment Initiative (REDI) which covers all forms of alternative energy including bio-energy.

Fibre

Table 8 indicates that the forecasted annual wood supply for Canada could drop by as much as 40% by the year 2150. This reduction in supply from all Canadian provinces could mean there is an opportunity in the long term in the more northern areas of Canada.

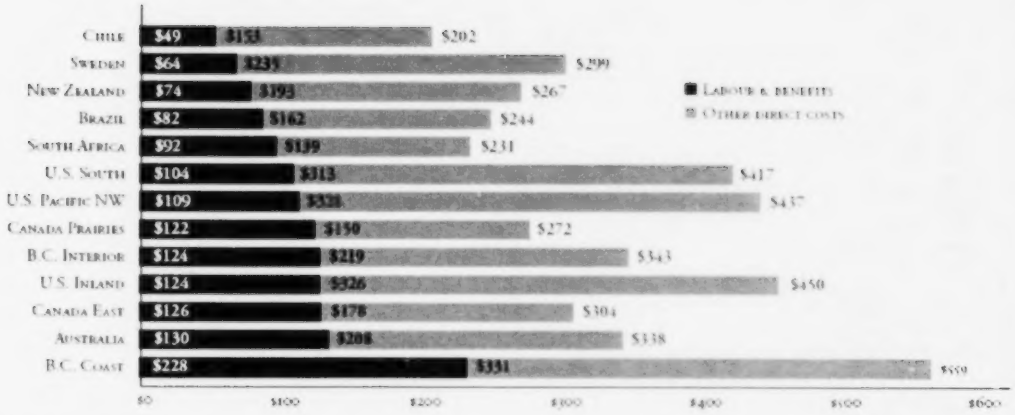
Table 8. Forecasts of Canada's industrial wood supply

	Units	2000	2010	2050	2100	2150
Softwood						
Annual supply	000 m^3	130 629	146 768	141 873*	140 242*	121 105*
Growing stock	000 m^3	9 279 202	9 046 455	8 574 755	7 848 493*	6 143 782*
Hardwood						
Annual supply	000 m^3	44 727	44 501	41 884*	41 924*	51 051*
Growing stock	000 m^3	2 360 485	2 312 182	2 134 593	1 991 334*	1 229 009*

* Not reported in all years, for all jurisdictions, see Tables 4 to 17 for more information.

Source: CCFM 2005

However, it remains to be seen if delivered wood costs will be competitive in an environment where a significant portion of the industrial wood production will likely shift to faster growing regions of the world (e.g. Brazil and New Zealand), as indicated in Figure 11.



Source: Pearse 1999.

Figure 11. Cost of producing lumber by world supply regions.

Table 9 indicates some current delivered wood costs and these costs are constantly changing. It is difficult to obtain up-to-date information of this nature due to the sensitivity of the information.

Table 9. Comparison of Delivered Wood Cost Components ($/m3)

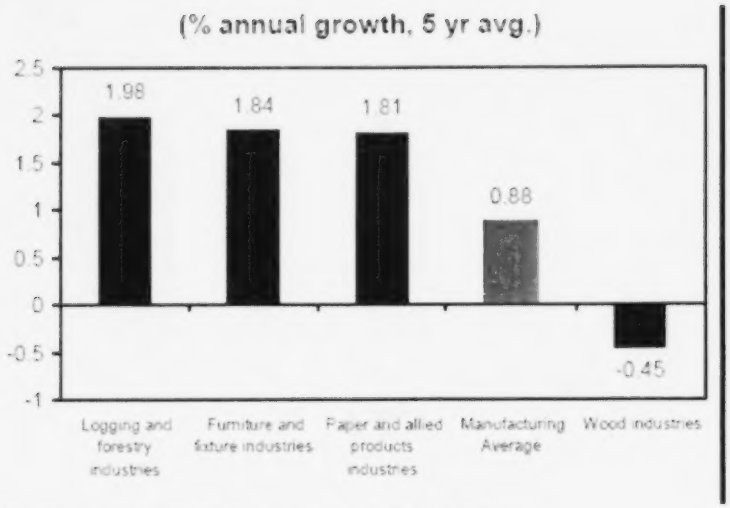
Cost Component	Yukon Current Costs	North B.C. 1996*	Saskatchewan
Planning	2.50-4.50	6.34	6
Road Building	2*	6.64	4
Stump to Truck	18 - 26	19.29	13
Hauling to Mill	10 - 12	9.54	10
Forest Regeneration	5	4.86	4
Stumpage	2.64	26.59	Not yet avail
Total	40.14 - 52.14	73.26	37

* Cost estimates are for temporary roads only.

Source: Williams and Bull 2002

Manufacturing technology

The forest sector is able to cut costs and enhance productivity by adopting advanced technology into its manufacturing processes. The average annual growth in productivity from 1998-2002 for the key paper and allied products, logging and forestry sub-sectors has outstripped that of the overall manufacturing and business sector, shown as the manufacturing average in Figure 12 (FPAC 2002).

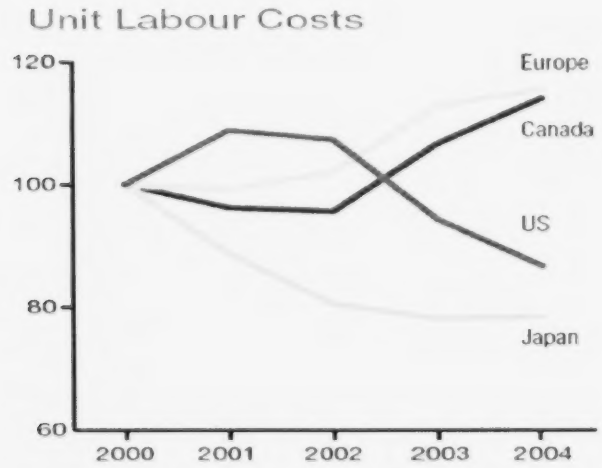


Source: Statistics Canada as cited in FPAC 2002.

Figure 12. Forest Sector Productivity in Canada.

Labour

While manufacturing has seen productivity gains, labour costs have continued to rise, offsetting some of those gains. As Figure 13 indicates, unit labour costs in Canada are now on par with Europe and significantly higher than in the US or Japan. This partially reflects the increase in the exchange rate discussed above, as well as increases in the Canadian dollar levels of labour cost. The rise in unit labour costs has an impact on competitiveness, unless, of course, there is a corresponding rise in labor productivity which is at least driven by having the workforce better trained and more highly skilled.



Source: IMF World Economic Outlook as cited in Price Waterhouse Cooper 2005.

Figure 13. Unit Labour Costs.

Canada then is facing global challenges, many of which are beyond its direct control. It also faces domestic pressure, which if not addressed, could lead to a greatly reduced role for the industry. For the forests of northern Canada, it will likely be very difficult to develop a commodity-based forest industry, since global competition is driving prices down, domestic costs are rising, and new policy barriers are emerging.

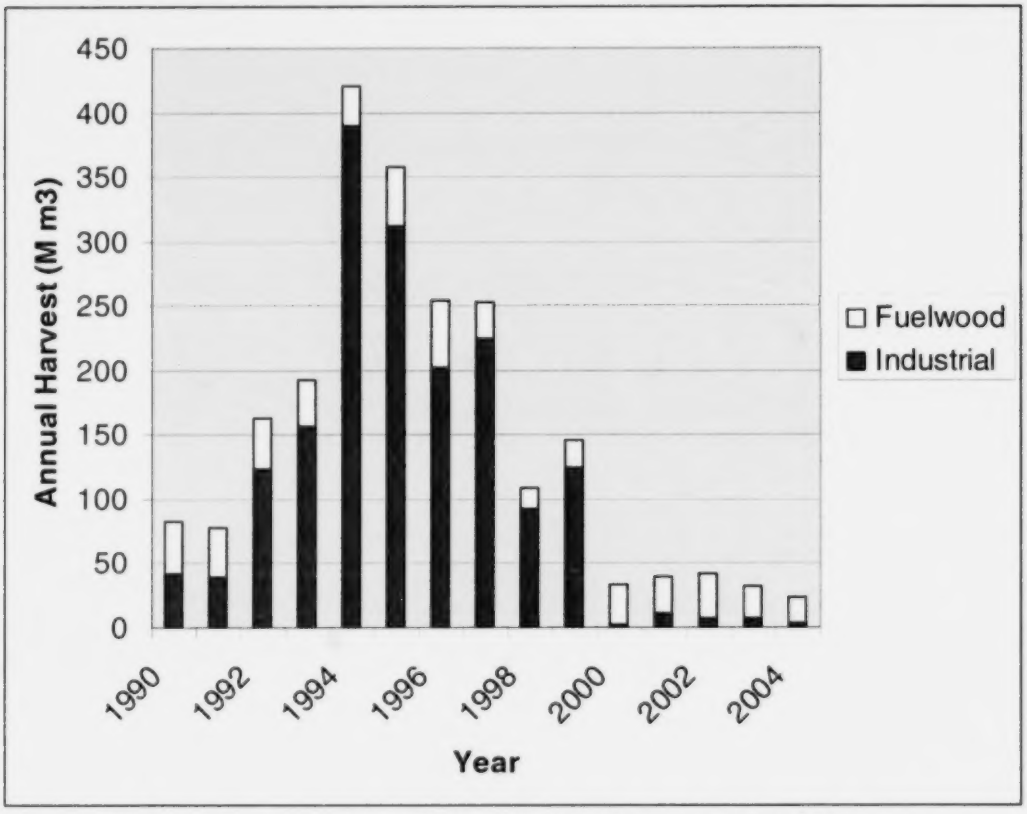
3.3 History and Trends in the Yukon Forest Sector

The Yukon forest sector has experienced a number of development efforts, including a short-lived boom in the late 1990's, but the net result has been that the primary manufacturing sector that exists today consists of a handful of small sawmills and portable saws, and the largest use of timber is for fuel. This history reflects the optimism that the Yukon forest resources can support a modest industry, counterbalanced by the difficulties of establishing a forest processing plant in the Yukon and the broader background of a painful decade for most of the Canadian forest sector.

Figure 14 shows the actual harvest volume, in terms of industrial roundwood and fuelwood, for each year from 1990 to 2004. The large spike in harvest volume that coincided with high lumber prices of more than US$400/Mfbm in the late 1990's is clearly visible. The drastic decline in harvest volume in 2000 was due to a sharp decline in lumber prices to an average of US$323/Mfbm in 2000/01 (Williams and Bull 2002). A second contributing factor to the decline was a change in timber allocation policy, in which INAC only issued timber harvest permits in response to acceptable proposals submitted in reply to Requests for Proposals (RFPs) to harvest specific areas of timber. This approach to timber allocation was not executed in a manner that encouraged responses – the set of RFPs issued in 2000 was withdrawn before any bids were received, while no bids were entered in response to RFPs issued in 2001. Williams and Bull (2002) concluded that the RFP's requested extensive planning and other commitments in exchange for relatively small volumes of wood and little security of tenure, and Tough (2002) concluded that the forest management system existing at that time was inadequate and incomplete.

There is a segment of the Yukon populace, especially in and around Watson Lake, which continues to believe that it is possible to establish a conventional forest products sector, albeit at a scale suited to the Yukon's resource. During the mid to late 1990's spike in timber harvesting, two moderate sized sawmills were set up in Watson Lake but as of 2000, they were no longer operating and the companies have since ceased forest activities in the Yukon. However, during this same period, Tough (2002) reported that "the great majority (up to 90 percent in some cases)" of the harvest volume was exported from the Yukon in the form of raw logs that were processed elsewhere. The Teslin Tlingit First Nation also purchased and operated a sawmill in Teslin for a period of several years, but this too closed in 2003 and there are no plans to re-start it. Clearly, the track record of medium to large-sized sawmills is not encouraging.

Figure 14. Actual Harvest Volumes in Yukon Territory (M m3/yr).



(Sources: National Forest Database; Yukon Territorial Government 2005a)

Price Waterhouse Coopers (2005a) recently assessed the estimated costs of logging and processing in the Southeast Yukon versus other Canadian regions, and concluded that the cost of logs delivered to Watson Lake would be from $2.00 to $14.50/m^3 higher than the costs in other regions (equivalent to a 4 – 30% cost disadvantage). Lumber processing and transportation costs in the Yukon were anywhere from twice those in BC to 28% higher than those in the Prairies. The report concluded that the break-even point for a Yukon sawmill would be $544/Mfbm (approximately US$480/Mfbm), which is higher than the recent peak lumber prices.

Price Waterhouse Coopers (2005a) also evaluated the option of harvesting wood in the southeast Yukon and transporting it to Fort Nelson for processing. The conclusion was that the transportation cost would be prohibitive, especially at a time when there is a glut of wood on the BC market due to mountain pine beetle salvage cutting. In short, according to Price Waterhouse Coopers' analysis, a conventional forest products sector would not be viable or sustainable.

Some of the present day circumstances bear this out – there are three timber harvesting permits that have been issued on the Kaska traditional lands but there has been little if

any harvesting. The permit-holders had planned to harvest the timber and transport it to Fort Nelson, but reportedly found that the price that they could achieve in Fort Nelson was roughly $\$10/m^3$ less than their costs would be.

The Price Waterhouse Coopers (2005a) report listed a number of challenges that a mill in the southeast Yukon would face (these have been aggregated and paraphrased below):

- Distance to markets is a critical cost disadvantage;
- Lack of adequate infrastructure in Watson Lake;
- Limited skilled workforce /need for workforce training;
- Substantial public hesitancy or opposition to large-scale logging;
- Yukon wood supply may not be large enough to support a competitive mill;
- Lack of clarity on key institutional /policy issues; and
- Industry reticence due to legacy of failures and perceived high regulatory costs.

However, an overview of the existing forest products industry in the Yukon reported a total of 81 wood-based enterprises, which are shown in Table 10 (Vector Research 2005). Three quarters of the businesses were year-round operations and half of all businesses had employees. Note that most of these businesses involved remanufacture of primary wood products; only five lumber mills were listed.

Table 10. Existing Wood Products Businesses in the Yukon – 2005.

No. of Businesses	Business Type
17	Furniture (outdoor, institutional, commercial, household)
12	Cabinetry (kitchens, countertops)
12	Millwork (moulding/ cladding, flooring)
9	Engineered wood products (trusses, log home and pre-fabricated home builders)
7	Logs and beams (posts, beams, railway ties and fuelwood)
6	Craft products (turned items, sculptures, holders)
5	Remanufactured products (custom sawing, paneling)
5	Lumber (dimension, rough sawn)
3	Containers (core boxes, flower boxes)
5	Other (boats, snowshoe repair, instrument repair)
81	TOTAL

Source: Vector Research 2005.

Many of these enterprises are small in scale, but 4 of 39 respondents to a question about the value of wood used reported using more than $100,000 worth of wood as input in the previous 12 months. Another five respondents reported using wood inputs valued between $50,000 - $100,000 during the past 12 months while 18 used less than $10,000 of wood. Roughly 2/3 of respondents indicated that they used some Yukon wood, the largest part of which was spruce (more than 90% based on 15 responses).

In response to a question about the value of wood products sold during the last 12 months, 7 of 43 respondents reported sales in excess of $100,000, while another 3 reported sales between $50,000 - $100,000. Eighteen businesses reported sales between $10,000 - $50,000. Thirty percent of 50 replying businesses indicated that they exported some of their production – an average of almost 30% of their sales came from exports.

Further survey questions asked about the nature of constraints on the business – the most frequently cited constraint was regarding difficulty getting access to wood in the Yukon. Fifteen percent cited financial constraints, while 11% cited shortage of skilled labour. Nine percent mentioned high input costs and nine percent mentioned high freight costs as issues[5]. Forty percent of businesses did not feel they faced constraints to expansion.

[5] Note that respondents could identify more than one constraint if they wished.

4 Yukon Forest Resources

4.1 The Forest Resource

The Yukon Territory contains the northwestern extent of the boreal forest in Canada. The principle tree species in the Yukon are all conifers –white and black spruce, sub-alpine fir and lodgepole pine. Hardwood is present but currently generates little commercial interest.

The inventory of the forested areas in the Yukon was completed in March 2006. The southern boundary of the Territory is on the 60-th parallel, and the forest inventory extends roughly to the 61-st degree of latitude. It is generally considered that commercial forest opportunities cease north of the 62-nd parallel.

Some indication of the relative size of the forest comes from forest inventory data in the National Forestry Database, which is circa 1991, and is shown below in Table 11. The Yukon Territory covers 47,897,000 ha (excluding water) and of this, 27,549,000 ha (58%) is forest land (most of the remainder is rock, ice, and tundra). However, 73% of the forest land is classed as non-productive and another 2% is unclassified, leaving only 25% of the forested area (7,470,000 ha) classed as productive forest (capable of growing trees of sufficient size and quality to warrant timber harvesting activities). In all, 16% of the Yukon landbase is productive forest.

Table 11. Forest Area and AAC Statistics for the Entire and SE portion of the Yukon Territory (thousand ha)

Land class	Entire Yukon Territory*	Southeast Yukon**
Total land	47897	6116
Forest - Productive	7470	2973
Forest - Non-prod	20021	3125
Forest - Unclassified	58	0
Reserved prod forest	73	1689
Available prod forest	7397	1284
AAC (M m3/year)	700	411
AAC/avail (m3/ha)	0.09	0.32

(Source: National Forestry Database)

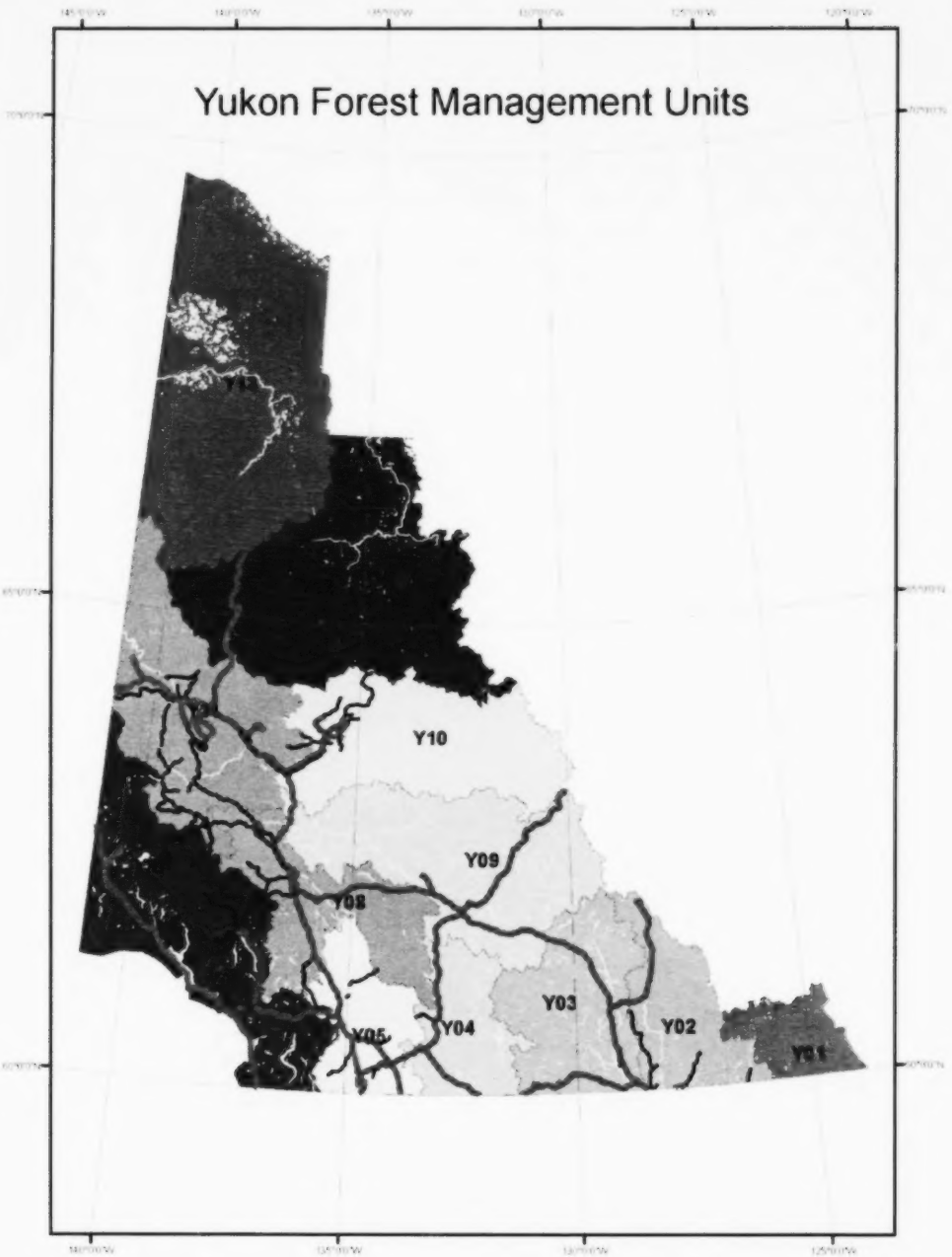
* AAC estimates from INAC, Preliminary TSA report (1998)

** all figures from Scenario 1 - Timberline Report (Feb 25, 2000)

An estimate of the Annual Allowable Cut (AAC) for the entire Territory, reported by INAC in 1998, was 700,000 m^3/yr. This figure, one of the few wood supply determinations for the entire Territory, translated to an average annual harvest volume of 0.09 m^3/ha/yr of available productive forest. Table 11 shows that there is more area of reserved productive forest in the SE Yukon than in the entire Yukon Territory – this apparent inconsistently reflects different assumptions regarding landbase availability in the two studies from which the timber supply scenarios were drawn.

Figure 15. Map of Forest Management Units.

Figure 15. Map of Forest Management Units.



The most productive forest areas are in the southeast part of the territory. Figure 15 shows the forest management units (FMU) into which the territory has been sub-divided. The most extensive and productive stands are in the extreme southeast Yukon, where about 60% of the forest land bears commercial forests and on a few sites, yields may exceed 400 m^3/ha.

As one moves north and west, the commercial quality of the forest declines markedly. For example, the commercial forest decreases to about 30 –45 % of the forest land in the area immediately surrounding Watson Lake, and yields are variable, ranging from as much as 300 m^3/ha on alluvial lowlands, to an average of roughly 140-150 m^3/ha. West of the Cassiar Mountains (which run north-south on the west side of Y03), only 10 – 15% of the forested land is considered commercial, and yields are more variable, averaging 110 -130 m^3/ha.

Watson Lake and FMU's Y02 and Y03 have been the primary focus of timber supply determinations. The majority of these FMU's lie in the Kaska traditional territory, and the Kaska are one of the First Nations most involved in forestry. The right-hand column of Table 11 shows landbase area data specific to the SE Yukon (Y01 – Y03), and indicates a productivity of 0.32 m^3/ha/yr (Scenario 1, Timberline Report, Feb. 25, 2000).

FMU Y01 is often considered to be unavailable due to lack of access – to access the area, it would be necessary to come up from the south through BC due to the rugged mountain range that divides Y02 and Y01. In a 2002 report, Timberline assumed that the best-case scenario was to ship the wood from Y01 to Fort Nelson for processing.

The far eastern part of the Teslin Tlingit traditional territory lies in the western part of Y03, with Y04 and part of Y05 also being in their territory. These FMU's are moderately productive and the Teslin Tlingit have been involved in forestry as well. Finally, Y06, the south west section of Y08 and the western part of Y05 lie in the Champagne-Aishihik traditional territory. These forests are also moderately productive and there has been past and planned interest on the part of the First Nation in forestry.

A considerable portion of the productive forest landbase is reserved from harvesting for environmental and cultural reasons. In Table 11, 73,000 ha are shown as being reserved from harvesting, leaving less than 7,397,000 ha of available productive forest. This figure is old and undoubtedly low.

Since 1993, settlement lands have been identified and agreed upon by many First Nations. Some First Nations that have not signed agreements, such as Tron'dek, are currently working with Yukon Government to develop a Memorandum of Understanding. This has led the First Nations with abundant forest resources to put tremendous effort into the development of forest management plans covering both public and settlement lands. The Champagne & Aishihik First Nation has completed a strategic forest management plan, an analogous plan is nearing completion for the Teslin Tlingit territory, and the Kaska draft regional forest management plan was made available for public review from June 23 – July 23, 2006.

Chapter 11 of the Umbrella Final Agreement (see section 5) encourages land use planning, but to date there have not been any land use plans developed. The website of the Yukon Land Use Planning Council[6] notes that the North Yukon Planning Commission is developing a land use plan that will be the first in the Territory and may provide a template for subsequent planning. Some First Nations representatives were concerned that land use planning had not proceeded more widely and questioned the value of strategic forest plans prepared in the absence of a land use plan.

Nevertheless, these management plans have designated substantial portions of both settlement and traditional public lands as being unavailable for harvest. Thus, undoubtedly considerably more than 73,000 ha are now reserved from timber harvesting.

The forest resource of the Yukon is generally old and the age class distribution tends to be very overweight in the older age classes. Two-thirds of the forest in the Coal FMU (Y02) and three-quarters of the forest in the Liard FMU (Y03) is 81 years of age or older (INAC/YG 2003) and the situation is similar throughout the Territory.

A recent timber supply factor is the widespread spruce bark beetle infestation, which has grown from roughly 42,000 ha in size in 2003 to 340,000 ha in 2005 (http://yukon.taiga.net/swyukon/beetle.cfm), with no sign of slowing (See Figure 16). This outbreak has killed numerous spruce in the Haines Junction & Whitehorse areas, but is apparently not a severe problem in the southeast part of the Territory.

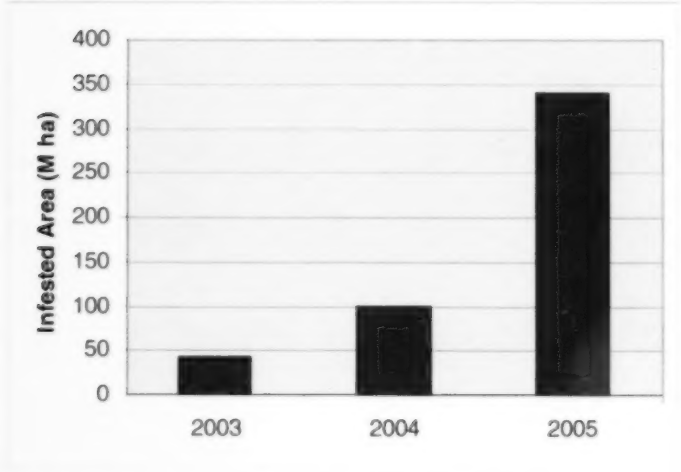


Figure 16. Area of spruce bark beetle infestation (ha)

The mountain pine beetle, which has killed many millions of hectares of lodgepole pine forest in BC, does not appear to have developed into an infestation in the Yukon, at least not at the present.

[6] http://www.planyukon.ca/

The final relevant factor is that forest renewal, especially of conifers, is usually a slow and chancey process. Increased drought in summer has added to the risks associated with renewal. Natural regeneration of conifer will not be reliably effective in many parts of the Yukon, requiring planting, which is expensive. Price Waterhouse Coopers (2005a) estimated the renewal costs at $\$8/m^3$ harvested, more than twice as high as the $\$3.50/m^3$ cost in B.C. Price Waterhouse Coopers noted that renewal costs were affected by long transportation distances and lack of economies of scale.

4.1.1 Southeast Yukon Timber Supply

As mentioned above, the nature of the resource has dictated that the greatest potential for commercial forest products manufacture lies in the southeast Yukon. Watson Lake, which would be the hub of any industrial development, had two sawmills during the late 1990's, but both ceased operations in 1999 and are no longer viable facilities.

There have been numerous timber supply studies during the last ten years. These include studies by:

- INAC: 1998 & 2000
- Peter Henry: Preliminary in 1998 and final in 2000
- Timberline: Feb 2000, workshop in August 2000, & 2005
- INAC/Yukon Government: Timber Supply Review 2003

The comparability of these analyses is limited. Some of the analyses only covered the two key FMU's – Y02 & Y03 – while others included Y01, and the INAC analyses included Y04, Y05 and Y06. Many of the analyses presented different scenarios, and so did not provide a preferred estimate. The earlier analyses were prepared at a time when the locations of some of the key settlement lands had not been finalized, and so suffered from a greater level of uncertainty about the landbase. A new inventory for Y02 and Y03 was completed in 2000, which also means that the earlier analyses are less useful today.

The two most recent analyses are indicative of the range of assumptions and outcomes that continue to create uncertainty with regard to timber supply. The Timber Supply Review, completed in January 2003 by the INAC/ Yukon Government Technical Timber Supply Committee, examined seven different options in FMUs Y02 and Y03. These options differed in terms of landbase availability and were identified in terms of the parties whose perspectives where used as assumptions and constraints.

The scenarios reflecting the views of the Yukon Forest Industry Association and the town of Watson Lake and its Chamber of Commerce were at the high end of the range, at 1.58 and 1.44 million m^3/yr, respectively. The maximum biological potential of the southeast was estimated at 1.63 million m^3/year. A somewhat lower harvest level – 1.28 million m^3/year - was derived by applying the practices in the Timber Harvest Planning and Operation Handbook, while the Watson Lake Forest Management Planning Committee scenario resulted in a harvest of 969,000 m^3/yr. The scenarios developed by three Yukon

ENGOs and by the Yukon Trappers Association led to harvests of 708,000 m^3/yr and 545,000 m^3/yr, respectively.

The report noted that no adjacency constraints were applied, and these would be expected to reduce the harvest levels by some 10 -25%, with the larger reductions occurring at the higher harvesting levels. Access was also not considered to be a constraint – it was assumed that access would be built to reach required timber as it was scheduled for harvest. Given the general lack of access in much of the Territory, and the many issues surrounding access construction, this assumption appears to be optimistic.

The most recent timber supply analysis in the southeast was undertaken for the Watson Lake Chamber of Commerce (Timberline 2005). This considered the three SE Yukon FMUs (Y01 – Y03) and modelled the supply within concentric zones with radii of 100 km, 200 km, and > 200 km, centred on Watson Lake. With a 15 cm utilization limit, the timber supply for the entire area was 739,000 m^3/yr, of which 350,000 m^3/yr was available within 100 km of Watson Lake and 668,000 m^3/yr within 200 km. These distances were calculated as aerial distances without regard for access.

Wood supply planning remains akin to hitting a moving target; the 2003 Timber Supply Review (INAC/YG 2003) did not include any First Nations input, since the Memorandum of Understanding on Forest Stewardship for the Kaska Traditional Territory had not yet been signed. The lack of explicit access route consideration in the Timberline (2005) work ignores the significant barriers to accessing FMU Y01. Furthermore, the Timberline analysis has not undergone public review, and that, taken with the lack of First Nations input, means that the results likely exceed any eventual AAC that will be determined. It is questionable whether inclusions in the analysis such as caribou winter range and inoperable areas (watersheds) will pass public scrutiny.

4.1.2 Yukon Forest Sector Trends

Table 12. Yukon Territory Annual Harvest Area (ha).

Year	Area (ha)
1994	2056
1995	833
1996	1921
1997	1450
1998	489
1999	603
2000	7
2001	49
2002	42
2003	17
2004	n/a

(Source: National Forest Database)

Harvesting activity was strong during the 1990's, but has fallen to very low levels, this is evident in both area and volume data. Table 12 shows a considerable amount of harvest area the Yukon in the mid to late 1990's, that dropped off sharply in 2000 and has stayed low since. Prior to 1994, the harvest area ranged from 350 – 650 ha/year.

Table 13 shows the amount of volume that was authorized for harvesting under timber permits issued by the government, and the actual harvest volume of industrial and fuelwood. The years shown for the timber permits correspond to the year of the first ¾ of the government fiscal year. Not surprisingly, the fuelwood harvest has been much steadier than the industrial wood harvest; it is affected by factors such as the price of alternate fuels, weather, etc. Most of the harvesting was in management units Y02 and Y03, which are in the Watson Lake area.

Table 13. Yukon Territory Annual Harvest Statistics (000 m^3).

Year	Authorized Volume (m^3)	Actual Industrial Harvest Volume (m^3)	Actual Fuelwood Harvest Volume (m^3)
1995	356.8	312	45
1996	252.7	202	52
1997	250.1	224	29
1998	199.0	93	16
1999	145.0	125	20
2000	69.4	3	30
2001	57.4	11	29
2002	[illegible].4	7	35
2003	[illegible]6	7	25
2004	[illegible].6	4	19

(Sources: YTG 2005a, National Forest Database)

It is striking that in much of the 2000 – 2004 period, the authorized volume has been well in excess of the total annual harvest. It is also of interest that in the peak years, such as 1999, timber harvesters applied for much more volume than was made available through permits. In 1999, applications were made for a harvest of 1,583 thousand m^3, but only 145 thousand m^3 was authorized.

Table 12 and Table 13 depict the boom and bust of the timber sector in the Yukon. The bust was driven by changes in the price of lumber as well as policy factors. The composite annual lumber prices, for the years 1997 – 2000, as developed by Random Lengths[7], were US$417, 349, 402, and 323 /Mfbm and there is a close correspondence

[7] Random Lengths. 2001. Yardstick - The Monthly Measure of Forest Products Statistics. September. 11(9).

between it and harvest volumes. This is to be expected, since a marginal industry will be very price sensitive, and there was a strong response to lumber prices. Policy factors also contributed to the drastic reduction in volume authorized in 2001, as government adopted a policy of only allowing applications in response to advertisements of wood availability. The Watson Lake area was the focus of the RFPs for Timber Harvesting Agreements issued in 2000.

4.1.3 Current Wood Supply and Harvest Situation

At present, there is very little timber harvesting in the Yukon. There is a fairly basic level of timber harvest for fuelwood – the Yukon government issues permits for some 30,000 m^3/yr for fuel and many of the communities have one or two members that own portable saws which are used to make beams and housing supports and other rough large timber products.

An interim harvest level of 128,000 m^3/yr has been set for three years in Y02 and Y03 FMUs, as well as the part of Y09 that falls in the Kaska traditional territory. This figure was derived from the 1998 Preliminary Timber Supply Analysis for the Southeastern Yukon (INAC/YG 2003). Of this, 50,000 m^3/yr is to come from the Coal FMU and 78,000 m^3/yr from the Liard FMU. The cut blocks have all been laid out and the last group is going through the environmental assessment process; these blocks are intended to provide an interim harvest level until a regional forest management plan can be developed which will demarcate the available landbase and the practices (e.g. reserve boundaries and adjacency rules) that will affect the available harvest. The draft regional plan was released for public review June 23, 2006.

Timber permits for an annual harvest volume of 84,000 m^3 were issued in 2004-05, representing an increase from the 50 – 60,000 m^3 level recorded during the three prior years (Yukon Bureau of Statistics 2005). Approximately 30,000 m^3 of the volume was identified as fuelwood each year; the balance was roundwood. However, between 2001 and 2004, an average of 7,000 m^3 of roundwood was cut annually, or about 20% of the permitted level.

Many of the permits are associated with the interim wood supply in the Y02 and Y03 FMU's – permits have been granted for a good part of this volume but the permit holders have not been very active harvesting because the price that the mill in Fort Nelson has offered to pay is approximately \$10/m^3 more than the cost of getting the timber there.

In early summer 2006, Champagne-Aishihik First Nation issued a request for proposals to harvest a substantial timber volume (from 800,000 – 1,000,000 m^3 over ten years), mainly salvage of mortality caused by the spruce bark beetle, over a ten year period. However, whether the proposals attracted by the RFP are beneficial, and whether the permits issued by the Kaska are operated, remains to be seen.

Another forest management initiative that is has involved considerable effort is the development of a Model Forest proposal. The Yukon has never had a Model Forest and

has made a number of attempts to secure one. Most recently, a proposal was developed for a Strategic Partnership Area in the Yukon, to be supported by the Champagne-Aishihik First Nation, Yukon Energy, Mines and Resources, and McGregor Model Forest Society. A proposal prepared in February 2006 was funded by the CFS and the Yukon is participating in Canada's Model Forest Program as a one-year project.

The recent request for proposals from the CFS for a five-year Forest Communities Program provides an additional opportunity. It is hoped that a proponent from the region will submit a proposal for a medium-term forest project with a moderate amount of federal funding ($400,000/year). A project oriented along the same lines as the February 2006 proposal would support many of the areas identified for additional work in this study. The four areas of emphasis were:

- Community-based partnership building and networking;
- Community engagement in forest land management, governance and innovation;
- Catastrophic disturbance response and adaptation to climate change; and
- Community exploration of alternative forest-based economic opportunities.

4.2 Non-Timber Forest Products

Discussions with First Nations Representatives and a review of relevant literature suggests that non-timber forest products (NTFPs) made use of by First Nations in the Yukon can be categorized into a relatively small number of classes.

1. **Food** - All the First Nations interviewed in this effort depended heavily on wild meats as a dietary staple. Interview subjects estimated that the percent of meat consumed in their communities which came from "the land" was no less than 50%, and up to 100%. Moose was by far the most common species identified, but others figured prominently too, including caribou, sheep, bison, snowshoe hare, ground squirrel (gopher), ptarmigan, ducks, and salmon.

   Berries (blueberries, raspberries, strawberries, cranberry, salmonberry, and others) were mentioned by every interview subject as contributing to the wild foods eaten by community members. Mushrooms and wild onions were identified as well, although the estimated proportion of the community which gathers and eats these foods was generally less than those who gather and consume berries.

2. **Medicines** - Several interview subjects identified that members in their community gather wild plants for medicinal purposes. However, the importance, or prevalence of this activity varied considerable from community to community. Some community members are guarded in discussing the specific plants which are used, in order to respect Traditional Ecological Knowledge (TEK) base about medicinal plants. However, information regarding Aboriginal medicinal plants for the boreal and Pacific Northwest regions is discussed considerably in the published literature (e.g. Kuhnlein and Turner 1991, Turner and Cocksedge 2001, Barry 2005).

Medicinal boreal plants commonly identified in the literature and cited by interview subjects include:

- Bearberry (Arctostaphylos uva-ursi) - tea from this plant can be used to treat a variety of bladder and kidney ailments, whereas rashes and other skin conditions can be relieved with a salve made from the leaves;
- Birch (Betula sp.)– sap can be made into a medicinal tonic to treat general malaises and headaches;
- Labrador Tea (Ledum groenlandicum) – Tea from the leaves has been used to treat skin problems, headaches, asthma, stomach aches and kidney problems. Ointment from dried leaves can be used to treat burns and scalds.
- Sphagnum moss (Sphagnum sp.) – The entire plant is antiseptic, and a tar extract can be used to treat a variety of skin diseases, including eczema and psoriasis
- Blueberry (Vaccinium sp.) – Not only a good food source, but also tea made from the leaves is used for its antiseptic and diuretic properties, useful in ailments of the urinary tract.
- Yarrow (Achillea millefolium) – tea is used to treat colds, coughs, tuberculosis and other respiratory ailments.

3. **Furs** – The prevalence of trapping seems to vary from community-to-community. Some interview subjects portrayed the activity as very common whereas others noted a significant decline in the level of interest and numbers of individuals involved in the activity. Some furs are used for domestic purposes (e.g. to make mukluks, mittens, etc), but most are sold into the broader fur markets. In most communities it was described as a hobby activity, although for a couple, it was described as contributing a substantial portion of income for a small number of residents.

4. **Crafts** – Historically many household and domestic objects were made from forest products. However, there seems to be relatively little of this still occurring. Most crafts which are produced are sold to tourists. All the interview subjects described this activity as being minor in their communities and contributing to the income of a very small number of people. Craft activities which were described include: mask making, willow carving, weaving of birch and pine-needle baskets, making snowshoes from spruce, antler carving and porcupine quill art. Several interview subjects indicated that there was a desire on the part of some community members to learn about craft-making, but there were relatively few elders knowledgeable about such practices to pass the skills on to younger people in the community.

5. **Forest existence values** – All those interviewed identified how their communities value the forest for spiritual and existence values. Although not necessarily described in these words, there was definite importance placed on the activities which involved getting into the bush to experience its wilderness and spiritual values. All interview subjects identified that most members of their communities spend at least some time engaged in outdoor activities – ranging from occasional recreational use, to living a traditional lifestyle in wilderness areas for several months of the year. Having access

to remote forest areas was identified as important by all interview subjects. Some communities have developed retreats or healing centers in forested wilderness areas.

The First Nations have an intimate relationship with the natural world and have a long tradition of living on the land. There is a rich traditional knowledge of many facets of nature, ranging from medicinal and culturally important plants, knowledge of birds, fish and animals, and knowledge of natural processes. While the language used to describe this knowledge is non-scientific, this knowledge in many ways transcends science and is poorly understood by non-First Nations people. It was stressed many times that traditional knowledge is important and needs to be integrated into forest planning and management on all lands, not just settlement lands.

4.3 Approximation of the Value of Non-Timber Forest Products

The Price Waterhouse Coopers report (2005a) is quite clear that a standard, commodity-based processing facility in the Yukon would not be competitive, and recent experience has added to the reality of this conclusion. This suggests that development of the sector would provide few sustainable benefits – the employment and stumpage revenue to the Territorial and First Nations governments would not last.

Average dues paid to the Yukon government between 2000 and 2004 have been $\$2.43/m^3$, for a total of \$82,600/year. If the full interim harvest of 128,000 m^3 was harvested, dues revenue would be \$311,000/yr, and if a harvest of 500,000 m^3/yr was taken, dues revenue would total \$1.2 million.

Estimated government revenue from the sale of hunting and fishing licences and fur harvests was calculated, as well as the value of food harvested from the wild. The estimated annual total was \$12.1 million/year, which is a conservative estimate of the value of benefits produced from the in situ forest – the revenue to outfitters, licence fees paid to First Nations, values from berries and other natural products, and benefits from tourism were not included in this analysis. The value of the auctioned Dall sheep hunt was also not included. The derivation of this calculation is shown in Table 14.

Table 14. Licence, Seal, Fur and Estimated Wild Meat Value ($/year)

Source of Revenue (Value)	Annual Value ($)
Hunting Licences	117,700
Game Seals	67,200
Fishing Licences	241,600
Fur Harvest	300,000
Value of Wild Fish and Meat	11,366,000
TOTAL	12,092,500

Licence and seal revenue data was obtained from the Yukon Territorial Government for 1997 – 2005, and averaged, since there were no strong trends, to produce the estimates shown in Table 14. Fur harvest value data were obtained from Yukon Government

Statistics for 1998-2005 (2005a). The value of wild fish and meat was estimated based on information from interviews with First Nation representatives and from the James Bay studies of the mid-1970's (James Bay and Northern Quebec Native Harvesting Research Committee 1982). (See Appendix 1 for more detailed information concerning how this figure was calculated.)

While the forest resource would continue to provide game, fish, berries, and fur if commercial scale forest-harvesting was permitted, it is anticipated that some reductions in the value would be realized. Given the scale of benefit provided by the forest, and the economic infeasibility of industrial-scale timber commodity production in the Yukon, it would seem that the resource is of far greater value if it is managed primarily for non-timber products and values.

We are not advocating no commercial harvesting – it makes sense to conduct small-scale harvests for fuelwood, hazard reduction and salvage, production of lumber and other wood products (e.g. logs for homes) for the local markets, browse production, and potentially for biomass for electricity and heating. However, under present conditions, a large-scale forest operation of the type that many wood supply studies have envisaged is not economically feasible, and does not represent the best use of the forest resource.

We also suggest, with the Yukon expected to experience severe impacts of climate change, that minimizing the extent of stress on the forest may help it to better withstand climate variations.

4.4 Tourism

Tourism is an important sector of the Yukon economy; overall annual tourism revenue was estimated at $170 million in 2005 (Globe and Mail July 1, 2006). This is an increase of 6% from the 2000 level of $160 million (Yukon Business Tourism and Culture 2003).

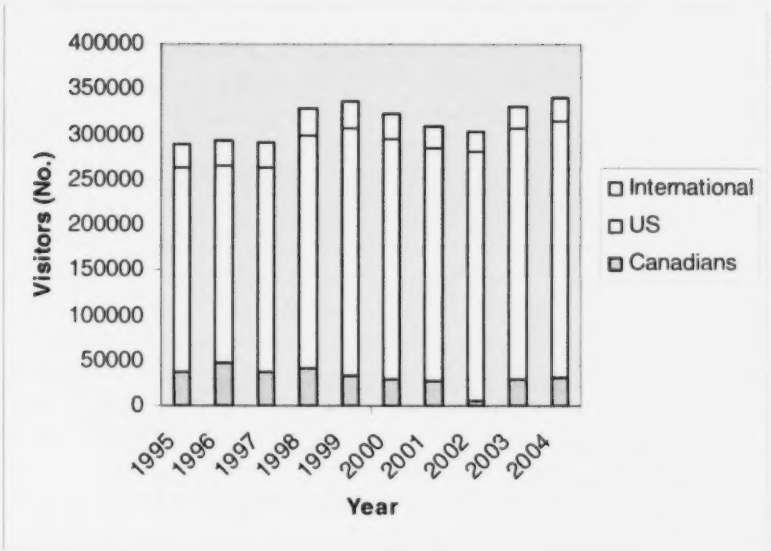


Figure 17. Yukon Tourism: Number of Visitors to the Yukon.

Figure 17 shows annual tourism statistics for the Territory. Tourism statistics are frequently sub-divided by mode of travel, with private car and motorcoach being the most common modes. Of the roughly 378,000 visitors to the Yukon during 2004, 316,000, or 84%, arrived by road. As the Globe and Mail (July 1, 2006) reported, most tourists enter by road, either via the Alaska Highway or along the Klondike Highway from the cruise-ship port of Skagway, Alaska. Most others arrived by air, with a few coming by boat. Tourism Yukon (2005a) reported that 7% of visitors came on business, 10% for personal reasons and the remainder as tourists.

The data in Figure 17 show a gentle upward trend; a decline in 2001 and 2002 is evident and can be attributed to the impacts of 9/11. However, subsequently, growth resumed and the Yukon outperformed Canada in 2005, increasing its number of tourists by 3% versus 2004 (Globe & Mail July 1, 2006). By far the largest proportion of tourists are Americans, who on average account for 81% of all tourists. International tourists account for 8% of visitors, while Canadians account for 11%. The Canadian proportion of tourists is lower than this figure would suggest, however. In 2003 and 2004, data were collected on the number of Canadian visitors who had Yukon licence plates, and the average figure was 36,400 or 54% of Canadian vehicle entries. Thus, Canadian tourists probably represent closer to 5% of the total number of tourists, based on these data.

Although Americans made up the largest proportion of visitors, their spending accounted for $38.4 million of visitor spending, or 51%. Canadian visitors spent $22.1 million (29% of spending) while visitors from other nations spent $15.3 million, or 20%. This reflects an average length of stay of three nights for American visitors versus 8 for Canadians and other nationalities. One might surmise that many American tourists either come into the Yukon for a few days as part of a cruise boat stop or have Alaska as the destination so that time in the Yukon was spent en route.

The Globe and Mail article (July 1, 2006) asked the question "Why so few Canadians visit the Yukon?" (or other northern Canadian territories). This is an excellent question, because the numbers do seem to be very low relative to our population.

Most tourists value the wilderness nature of the experience, whether it is for hunting, fishing, rafting and canoeing, hiking, or nature-observation. Thus, the quality of the forest plays an important role in setting the quality of the experience. Historical sites and cultural interests also play subordinate roles in attracting tourists, but likely contribute to the attractiveness of the Territory as a destination. These are the features that the Territory emphasizes in its tourism marketing strategy (Yukon Government 2000).

As would be expected, tourism is heavily skewed to the summer months. Tourism Yukon (2005b) reported that 214,418 visitors came by road during the June- August period, representing 68% of all road-based visitors that year. The peak month was July, when 80,224 people were reported to visit the Territory by road. Another 11% came during September and 7% during May. In each of April and October, roughly 10,500 people traveled to the Yukon by road, and approximately 4,200 per month journeyed by car or motorcoach during November to March.

In the view of the consultants, there are significant opportunities to increase off-season tourism. This would also boost tourism revenues, since in 2004, tourists in the peak June-September season (79% of tourists) spent an estimated $75.8 million while visiting (Tourism Yukon 2005a), or only 45% of annual tourism revenue. Thus, tourists during the off peak season spend considerably more per person than summer tourists.

One of the attractions for off-peak tourism might be the low number of other tourists. Tourism increases were predominantly driven by increases during peak season. Tourism Yukon (2005b) reported a 6% increase in visitors between May and September in 2004, compared to 2003. However, the greatest percentage monthly increases were in June (9.9% yoy) and July (7.8% yoy). In contrast, the year over year increases in May and September visitors were 3.2 and 3.1%, respectively. These two months are much less busy than the three summer months, and while the days are shorter, the weather is generally warm and the scenery remains spectacular. The consultants spent an enjoyable week in the Whitehorse area in March with very favourable conditions and no crowds.

5 Umbrella Agreement, Settlement Agreements, and Legislative Framework

As in the rest of Canada, the process of reaching land claims agreements with Yukon First Nations has been long and complex. More than a century ago, when the impact of the gold rush was being felt, Yukon First Nations realized there was a need to develop agreements with Canada which recognized their land ownership and tenure rights. The official process began considerably later – in 1973, when the Yukon Native Brotherhood, which consisted of 12 Yukon First Nations bands, made representation to the Prime Minister of Canada. Later that year, the Yukon Native Brotherhood and the Yukon Association of Non-Status Indians created the Council of Yukon Indians (CYI) to negotiate land claims on behalf of the Yukon's First Nations.

Early attempts at negotiations were somewhat sporadic, reaching a low point in 1984 when an agreement in principle between negotiators was rejected by the CYI as it called for too resolute an extinguishment of aboriginal rights in exchange for claim agreements.

The process was revitalized using the notion that the negotiation process would result in one template agreement, to be called the Umbrella Final Agreement (UFA), whose provisions were to be incorporated into each First Nation's individual agreement. In 1993, the UFA was signed by Canada, the Yukon government and Yukon First Nations, represented by CYI. Four First Nations reached individual agreements using the UFA framework in 1993, and seven other First Nations have reached agreements since. The following First Nations have reached agreements under the UFA:

- Vuntut Gwitchin First Nation (1993)
- First Nation of the Nacho Nyak Dun (1993)
- Champagne and Aishihik First Nations (1993)
- Teslin Tlingit Council (1993)
- Selkirk First Nation (1997)
- Little Salmon/Carmacks First Nation (1997)
- Tr'ondëk Hwëch'in First Nation (1998)
- Ta'an Kwäch'än Council (2002)
- Kluane First Nation (2003)
- Kwanlin Dun First Nation (2005)
- Carcross Tagish First Nation (2005)

White River First Nation, Liard First Nation, and Ross River Dena Council have not concluded their land claim agreements and remain bands under the federal Indian Act.

The UFA and the self-government agreements (SGAs) signed by individual First Nations are tremendously complex documents covering many aspects of government and land management. For the purpose of this project, we will briefly describe a small number of the most relevant elements.

5.1 Settlement Lands

There are three categories of settlement lands identified in the UFA and SGAs[8]:

Category A – Lands on which the First Nation has equivalent to fee simple title to surface and sub-surface rights. This means that the First Nation has the right to use the surface of the land and what is underground, such as minerals and oil and gas. The First Nation also has exclusive hunting rights on these Settlement Lands. The First Nation retains Aboriginal title on Category A lands. A total of 25,899.88 km^2 of Category A lands was identified in the UFA, representing 5.5 % of the 474,391 km^2 of the Yukon landbase.

Category B – Lands on which the First Nation has rights equivalent to fee simple for the surface of the lands only. There is no right to mines and minerals other than gravel and top soil. The Yukon public continues to have access to Category B lands for fish and wildlife harvesting. The First Nation retains Aboriginal title on Category B lands.

Fee Simple – Land owned under the same form of fee simple title as is commonly held by individuals who own land. For example, buying an individual lot in a subdivision will normally be held in fee simple title. A total of 15,539.93 km^2 of Category B and fee simple lands was identified in the UFA, or 3.3% of the total Territorial area.

5.1.1 Renewable Resources Councils and Forest Management Provisions

The Umbrella Final Agreement and SGA's contain important provisions dealing with the First Nations' role in forest resources management, both on and outside their Settlement Lands. One of the key aspects is that, in each First Nation's Traditional Territory, the Agreement envisages the establishment of a Renewable Resources Council "as a primary instrument for local renewable resources management in that Traditional Territory". Three members of each Council are appointed by the First Nation and three by the Yukon Minister of Energy, Mines and Resources.

The Minister is obliged to consult the Councils prior to establishing a new policy likely to significantly affect forest resources management, allocation or forest practices, and prior to recommending legislation concerning Yukon forest resources. Likely more important is that the Councils may make recommendations to the Minister and the First Nation about a wide range of forestry matters, including forest resources inventories and management plans; policies and legislation; research; forest fire suppression plans; allocation and use of commercial timber, including forms of tenure and rates of harvest; employment and training; and measures for the control of forest pests and diseases.

The Tough Report (Tough 2002) concludes that the provisions of the Agreement make it clear that First Nations and their members will play a crucial role, as governments, as entrepreneurs and as employees in the Yukon's forest future (See section 5.2.1). In summarizing the intended impact of the UFA regarding forest management, Tough

[8] Definitions are taken from the Yukon Claims Glossary on the Indian and Northern Affairs Canada web site (www.ainc-inac.gc.ca/nr/prs/j-a2003/02278abk_e.html)

(200 noted that government-to-government co-management of the Yukon's forests, and joint ventures between First Nations companies and outside corporations, should become the normal manner in which forests are to be managed in the Yukon.

5.1.2 Self Government

The SGAs for the individual First Nations generally provide for similar manners of autonomy[9]. Each SGA is empowered by specific legislation for the agreement. Each First Nation entering into a SGA has law-making powers on settlement lands in the areas of land use and control, hunting, trapping and fishing, licensing and the regulation of businesses. The SGAs also provide the First Nations with the power to enact laws for its citizens in the Yukon, off settlement lands, in the area of language, culture and spiritual beliefs; health care and services; social and welfare services; training programs; adoption, guardianship, custody, care and placement of children; education programs and services; estates, resolution of disputes outside the courts; and licenses to raise revenue.

The SGAs set out compatible land use provisions under which the First Nations, the territorial government and adjacent municipalities can establish a joint planning structure to avoid adverse impacts on adjacent settlement or non-settlement lands.

The SGAs do not prejudice the ability of the individual First Nations to exercise or benefit from existing or future constitutional rights for First Nations peoples. As well, the SGAs will not affect any Aboriginal claim, right, title or interest, or the identity of Yukon First citizens as Aboriginal people of Canada.

The SGA's contain many provisions that are relevant to how various recommendations made in this study might be acted upon; the consultants have not explored these in any detail since they are complex and may vary somewhat from SGA to SGA. The consulting team feels that determining how the terms of the various agreements come into play in enacting any of the study recommendations is best left to the parties, who have demonstrated a thorough knowledge of these agreements and their implications.

5.2 Forest Management Policy and Legislative Background

With devolution of the responsibility for forest management from the federal government (specifically INAC) to the Yukon government in 2003, the Yukon now has more control over its forest resources, as well as the responsibility for ensuring that the forests are managed appropriately. An outcome of devolution was the opportunity for the Territory to develop its own forest resource management legislation. This effort, which was initiated in the mid-1990's, accelerated after 2003. There have been several significant public consultations relevant to Yukon forest policy over the past decade:

- Draft Yukon Forest Management Policy (1996)

[9] The above description of the facets of self government was largely taken from a description on the Indian and Northern Affairs Canada web site (www.ainc-inac.gc.ca/pr/agr/ykn/hil_e.html)

- Yukon First Nations Statement of Beliefs – Forest Management (Draft 1998)
- Canada Forest Accord and National Forest Strategy (1998, updated in 2003)
- Yukon Forest Strategy (1998)
- Forest Summit (2001)
- Forest Policy Framework Discussion Paper (2003/04).

Each initiative has played a role in defining the path for forest management in the Yukon. Each has stressed sustainability as one of its main themes. The report from the most recent consultation effort, the Forest Policy Framework Discussion Paper (2004), provided a summary of the points from six themes identified in the consultation:

1. Relationships and Participation

- A respectful and co-operative relationship between governments, resource councils, stakeholders and the public is fundamental to ensuring sound forest management.
- Effective and timely participation in forest policy and planning processes are essential and carry obligations and responsibilities for all involved.

2. The Forest Economy

- Consider all forest-based economic values when developing a balanced, sustainable and stable Yukon economy.
- The forest-based economy of the Yukon includes commercial wood-based industries; commercial forest uses that do not consume wood but rely on the forest and non-commercial goods and services.
- Provide a variety of forest tenure opportunities in order to encourage long-term investment and responsible management.

3. The Forest Environment

- Forest management will be guided by the principle of sustainability and stewardship.
- Recognize Yukon forests as complex ecosystems where plants, animals and physical factors such as soil and water interact and are dependent on each other.
- Manage Yukon's forest ecosystems in such a way as to maintain the natural variety of biological species, the quality of the physical environment and genetic diversity.

4. Management and Planning

- Planning acts as an investment in the future of our forests and communities. While the cost of planning is expensive, there is even a higher cost for not planning.
- Forest management planning will be community-based and provide regional direction on the right balance of ecological, social and economic objectives.
- Follow an adaptive and integrated approach with clear objectives that supports timely decisions.

5. Education, Training and Capacity Building

- To achieve maximum benefits from forests use, and enable effective participation in forest management planning, Yukon requires knowledgeable and capable individuals and communities.

6. Research and Innovation

- We need to continually explore new ideas and techniques that allow a spirit of creativity to prevail as we seek solutions to our common challenge.

5.2.1 Tough Report

An extremely significant event in the recent evolution of Yukon forest management was a review of the contemporary issues facing forest management in the Yukon undertaken by George Tough (Tough 2002). Prior to devolution, Mr. Tough was engaged by INAC to advise the Minister about a number of issues related to forest policy and management. Some of the issues dealt with particular circumstances, such as the difference of opinion about the annual allowable timber harvest in southeast Yukon.

Pervasive through the 19 recommendations identified in the Tough report is a central theme – that forestry in the Yukon should be on a scale and of a nature reflecting Yukon forest realities. Forest management and industry activities must conform to sustainable forestry norms, under a made-in-Yukon framework that meets modern-day national standards. Moreover, there must be an important role for First Nations governments and enterprises in forest management and industrial forestry. Several of the report's recommendations were supportive of the involvement of the Kaska Forest Stewardship Council in planning forest management in the Southeast Yukon.

The Department of Indian and Northern Affairs has indicated support and movement on addressing most of the recommendations in the Tough report.[10]

5.2.2 Legislation

Forest management legislation in the Yukon is being developed in a thoughtful and inclusive manner. Planning on the content and structure of the Forest Stewardship Act and the nature of tenures to be issued is ongoing - discussion papers on these aspects of the management framework have been developed and are in circulation. The government of the Yukon is receiving input on the discussion papers, and so the framework is still unfolding. Nonetheless, some key aspects of the management framework are becoming clear, and so can be identified with some degree of confidence.

It is anticipated that the Act will address: sustainability and stewardship; encouragement of a vigorous, efficient and competitive forest resource economy; maximization of social,

[10] Indicated on the INAC Web site: http://www.ainc-inac.gc.ca/nr/prs/m-a2002/02147bk_e.html

economic and environmental benefits for present and future generations; and management, protection, and conservation of forest resources.

Planning and practices, tenure, and compliance and enforcement are described as the three pillars of the Forest Stewardship Act:, which are supported by certainty and accountability. The planning and practices portion of the framework is intended to describe a hierarchical approach to forest management planning in which site plans are developed within the context of development and landscape unit plans, which are themselves developed within the context of strategic forest resources management plans. The hierarchy will proceed from strategic to tactical concurrent with proceeding from broad to fine spatial scales. A series of manuals/guides or direction is anticipated covering forest management planning, biodiversity, connectivity, cumulative impacts, adaptive management and local and traditional information.

Tenure is obviously a critical part of the management framework. At present, a three-tier system is being considered. The three tiers will likely be composed of forest resource stewardship tenures, licenses and permits, which can be thought of as a spectrum ranging from long-term comprehensive rights in which government assumes little responsibility, to short term, limited rights in which government assumes virtually all management responsibilities except for harvesting. Associated with the various tenures are specific conditions associated with a host of aspects, such as the duration for which the tenure is granted, the renewability of the tenure, transferability, appurtenancy (mandatory local benefit), the method by which tenure is awarded, operational stipulations, and dues rates.

The compliance and enforcement pillar will include identification of the powers of forest officers, mandatory compliance requirements and the identification of remedies, orders, and penalties associated with transgressions of various types.

Certainty is intended to provide a level of assurance to tenure holders that their positions are secure. This certainty is required to encourage long-term investment and responsible management. Certainty is also intended to provide Yukon citizens with assurance that management of the forests is proceeding with their best interests at heart. It is anticipated that this aspect of certainty will be addressed through the creation of a Forest Policy Advisory Board, and through local or community-based planning teams that will develop and recommend strategic forest management plans. In addition, it is anticipated that the public will have sufficient opportunities to review and be involved in planning. Aspects of certainty related to First Nation interests include:

- the planned legislation will contain non-derogation provisions;
- the ability to enter in partnerships with a First nation, or any other government to promote or enhance forest management;
- the legislation will contain provisions so that it is consistent with the forest resources harvesting provisions of the UFA; and
- the ability to enter in agreements with unsettled First Nations regarding the use, allocation and award of Forest Resources.

It is anticipated that accountability will be provided for through a variety of measures, including:

- establishment of process by which industry, stakeholders and the public can appeal decisions made by government staff;
- published reports on forest management performance and future priorities;
- requirements for appropriate resource management training for those involved in forest management; and
- establishment of a reforestation fund, which will use a portion of the stumpage fees collected specifically for silvicultural and reforestation efforts.

5.2.3 Anticipated Involvement of First Nations in Forest Management

As outlined above, there are a number of mechanisms in place, and others are planned which are intended to strengthen and foster the role of First Nations in forest management. These factors include:

- The rights of First Nations related to surface resources on settlement lands;
- Explicit recognition of the role of First Nations in forest management in the Umbrella Final Agreement;
- Several aspects of the autonomy provided to First Nations in the Self-Government Agreements;
- Explicit recognition of the role of First Nations in resource management in the series of public consultations which have taken place since the mid-1990's;
- Several of the recommendations in the Tough report, which are intended to foster the role of First Nations in forest management;
- Non-derogation provisions identified in the draft Forest Stewardship Act;
- Recognition of the UFA provisions related to forest management in the Forest Stewardship Act; and
- Mechanisms proposed in the Forest Stewardship Act intended to foster partnerships between First Nations, and other governments.

It is within the context of this enabling framework, that the efforts described in this report are intended to fit.

6 First Nation Participation in the Forest Sector

Statistics Canada provides the only source of detailed information regarding current First Nation participation in the Yukon Forestry Sector that was identified by the consultants. The information used below was obtained from First Nations Forest Program staff, and is not part of the publicly available information. These data were supplemented by information provided to the consultants during interviews.

The most recent Statistics Canada census data were collected in 2001, and so are somewhat out of date. At that time, the Teslin mill and a smaller mill near Whitehorse were operating – so the employment numbers today are likely lower than depicted in the census. Our interviews supported this assumption.

Table 15 shows Statistics Canada data regarding employment in the Yukon in forest-based sectors, for all people, for those of Aboriginal identity, and for non-Aboriginal identity people. The size of the labour force, the number of people employed, and the unemployment rate are shown.

Overall, the forest sector labour force consisted of 320 people, of which 140 (46%) were of Aboriginal identity. The employment rate was very low however, at 200 people, representing an unemployment rate of 37.5%. The number of employed Aboriginal people in this sector was 60, or 33% of the employed people in this sector. The unemployment rate for Aboriginal people in this sector was 57%, versus an unemployment rate of 22% among non-Aboriginal people in this sector.

Statistics Canada estimated the total Yukon labour force as being 17,950 people, and so the forest sector labour force accounts for only 2% of the Territorial total. The Territorial unemployment rate was 11.6%, considerably lower than the unemployment rates in the forest sector. The Aboriginal labour force was estimated at 3,185 people in the Yukon, and 4% are in the forest sectors shown in Table 15. In short, the forest sector is a minor employer in the Yukon, even in the First Nations communities. The high unemployment rates would certainly deter many people from entering the sector.

The Logging and Forestry sectors (as identified by the Standard Industrial Classification Codes 1131, 1133, and 1153) account for the most important sub-sectors of the forest industry that generate employment in the Yukon. The Aboriginal and non-Aboriginal labour force is 175 people. Of these, 95 were employed in 2001, for an unemployment rate of 46%. Of this labour force, 70 individuals were identified as being of Aboriginal identity, and of these, 30 were employed.

Stats Can 2001 identifies an additional 85 people of all backgrounds in the forestry support labour force – of these 55 are employed, for a 29% unemployment rate. Aboriginal people comprise 45 of these members of the labour force, and 35 are employed for a 22% unemployment rate.

Finally, 110 people of all ethnic backgrounds are identified as being in the wood industries sectors in the Yukon. Roughly half are Aboriginal, but only 20 of the 55 are employed, whereas all 60 non-Aboriginal people in this industry segment are employed.

Statistics Canada also reported some information regarding registered Indians on reserve in the Yukon (this information was also supplied by the First Nations Forestry Program).. In the Yukon, 20 registered Indians on reserve are employed in the logging and forestry sector, earning a median income of $12,288 per year. The unemployment rate is 50% of registered Indians on reserve in the Yukon in the logging and forestry sector. One third of this work force has no educational certificate, 43% have completed post secondary education or obtained a trades certificate (StatsCan 2001).

In summary, there is at present a relatively small amount of employment generated by the forest sector in the Yukon, but unemployment rates are high and the sector is probably not particularly attractive.

Table 15. Aboriginal and Non-Aboriginal Forest Sector Employment Data.

Industry Sector /Segment	Total Yukon Territory			Aboriginal identity			Non-Aboriginal identity		
	Labour Force	Number Employed	Unemploy't Rate %	Labour Force	Number Employed	Unemploy't Rate %	Labour Force	Number Employed	Unemploy't Rate %
Total – Industries	17950	15860	11.6	3185	2315	27.2	14760	13540	8.3
1142 Hunting and trapping	30	20	33.3	15	10	0	15	10	0
Logging & forestry	175	95	45.7	70	30	57.1	105	65	38.1
Logging 1131, 1133	95	40	57.9	35	10	71.4	55	30	54.5
1132 Forest nurseries and gathering of forest products	0	0	0	0	0	0	0	0	0
1153 Support activities for forestry	85	55	29.4	35	15	42.9	45	35	22.2
Wood industries 3211,3212,3219	110	85	22.7	55	25	45.5	60	60	0
Paper and allied products 3221,3222	0	0	0	0	0	0	0	0	0
TOTAL - Forest Based Sectors	320	200	37.5%	140	60	57.1%	175	135	22.9%

(Source: Statistics Canada, 2001 census, provided by First Nations Forestry Program)

6.1 Participation in Commercial Non-Timber Forest Products and Tourism

Although there was a general awareness of the potential for NTFP and tourism to generate revenue for First Nations individuals and communities, relatively little income is presently being generated from these sources. Representatives of several communities described how a small number of individuals made crafts for sale to tourists, but these activities clearly contributed a very minor proportion of the communities' incomes.

Tourism

Representatives of several First Nations indicated that their communities recognized that potential existed in developing income-generation from tourism ventures associated with First Nations/wilderness experiences, but few had attempted serious endeavours along these lines.

A small number of First Nations businesses were described in the interviews. Most significantly, the Old Crow First Nation owns a major share of Air North, which has six planes and thirty staff, and provides travel and cargo service throughout the Territory and into Alaska, Alberta, B.C. and NWT. Other businesses cited were smaller in scale or revenue generation - such as a boat service in Kluane National Park. Several interview participants cited the lack of appropriate infrastructure and experience as impediments to greater involvement, and one person felt that few community members expressed much affinity for the tourism sector.

Hunting and Guiding

Individuals in some communities are employed occasionally as hunting guides. Although these were described as relatively well-paying opportunities, they were usually described as intermittent or irregular in nature, and therefore generally not as stable income-generators. Opportunities to develop an outfitting business are not common, since they are regulated by the territorial government and become available only very infrequently.

One community (Burwash Landing – Kluane First Nation) has developed a means of capitalizing on tourism-based hunting. As part of its Settlement Agreement, the First Nation negotiated the right to auction off one Dall sheep hunt per year on its settlement lands. Recently the first year's hunt was auctioned off in Nevada for a considerable sum of money. The community has in place definitive plans for its wildlife management activities to benefit from the income generated. As well, a portion of the income will be provided back to the community for general management purposes. Although this activity is not specifically forest-based, it is making use of First Nation's natural resources, and capitalizes on the wilderness nature of the experience. We were informed that other communities are monitoring the success of this venture with an eye towards possibly undertaking a similar venture on their own settlement lands.

On the other hand, representatives of some communities stated categorically that their community did not believe in making money from hunting wild animals. Therefore, such opportunities would not be considered by them.

Mushrooms

Representatives of three or four communities noted that at least a small number of residents were involved in mushroom picking. Morel mushrooms fruit in abundance for two or three years following fires, although they are always present in the forested landscape at low numbers. Morels are marketed as a fresh or dried ingredient for gourmet cooking. Interviewees noted that there is reasonable money to be made by mushroom picking and that several families in different communities have been involved during times of high abundance. The Yukon Economic Development Department produced the document "A Mushrooming Industry?" (Yukon Economic Development 2005). The document describes the industry, and opportunities for morel harvesting and distribution in the Yukon. The document lists mushroom companies, describes processing opportunities, the Yukon's advantages in the industry and other information sources and is clearly intended to spur-on entrepreneurial activities related to the mushroom industry. Although a somewhat cursory document, it is clearly a good resource for anyone interested in exploring economic opportunities associated with mushroom harvesting and distribution.

Crafts

As noted in Section 4.2, a small number of individuals are involved in the production of crafts for sale to tourists. Those involved in craft production are usually engaged in it as a part-time or hobby-type activity. Although these are not large-scale, nor high-income generating opportunities, they were described as important for a small number of individuals. Distribution of products was local, with sales at local tourist facilities. In some cases products were supplied to regional centres (i.e. Whitehorse or Watson Lake) for sale at First Nations handicrafts shops.

7 Conclusions and Opportunities

This report has reviewed the current status of the Yukon forest sector, the character of the resource, key factors affecting the use of the resource, and the extent and nature of involvement of Aboriginal people in the development and use of the resource. Our view is that a conventional, export-oriented forest product mill facility is inappropriate and does not constitute a viable opportunity. This conclusion, based on recent and current experience, as well as a recent analysis by Price Waterhouse Coopers (2005), is grounded in our assessment that:

- The costs of delivered wood and of transporting manufactured goods will be very high in the Yukon, which translates into a substantial competitive disadvantage;
- Employment from such an enterprise will not be very significant, limited further because outside managerial expertise will likely be required; and
- Transportation and production costs are likely to continue to increase in future, especially the energy-related components, while continued global competition will maintain downward pressure on forest product prices – hence the competitive status will not improve and probably deteriorate further in the foreseeable future.

The indirect implications of developing a mill are also inappropriate for the Yukon. The high delivered wood cost will lead to downward pressure on the value of standing timber, which will reduce public and First Nations revenue from stumpage payments. At the same time, the cost of forest renewal is quite high and renewal success is especially uncertain in the Territory. There will be pressure to cut corners in the different renewal practices that would be applied, which does not bode well for the sustainability of the resource.

From a positive perspective, it was evident that the forest resource now produces benefits that have substantial value –game, fish, berries, and other non-timber products that are harvested for personal consumption, licence fees, and the important role of the forest resource in making the Yukon an attractive tourism destination. We also observed first-hand that many Yukoners place a high value on the natural condition of the land, and such pristine landscapes will only become more highly sought after in the future, in our view. We also contend that, since the Yukon is expected to experience greater than average impacts from climate change, an intact healthy forest will be more resilient and this is an approach that might mitigate some of the negative impacts of climate change. In our view, these current and future benefits and values significantly outweigh any benefits that might accrue from large-scale timber harvesting (and we doubt that there are any), and they would be compromised by significant timber harvesting activity (especially the attendant access). At this time, the standing trees are worth far more than the harvested timber.

However, we do believe that there are good reasons why a modest level of timber harvesting should be encouraged, and we are by no means suggesting that timber should

not be cut in the Territory. In addition to the provision of timber for human use, timber harvesting is useful for the following purposes:

- the salvage and removal of mortality caused by the spruce bark beetle, and other natural disturbance agents;
- the reduction of forest fire hazard to communities (which is related to the point above); and
- the creation of young forest and browse for moose and other animals.

Our vision of forest use, which is not much different from current usage, will support the maintenance of Aboriginal cultural identity and values, and supplement household incomes through the provision of wild food and other non-timber products.

During our discussions with our interview participants, and our review of various documents and reports, it became apparent that there was a high degree of consensus regarding some underlying, fundamental principles. Most notable were:

Consultation and Respect: The various parties should continue to consult and give respect to the viewpoints of others.
Working Together: It is important for all parties to work together. Consultation and respect provide a foundation for partnerships and cooperation.
Traditional Knowledge: Aboriginal people have a profound knowledge of the natural environment, and the connections between the elements of nature, and this knowledge needs to suffuse policies, plans, agreements and resource management activities.
Sustainability: The forest, water, and air, and all that is in them must be managed sustainably in a holistic manner.
Land Use Planning: Land use planning was identified as an important basis for resource management and it would be desirable for regional land use plans to be developed before more specialized plans, such as strategic forest management plans.

In the remainder of this section, we outline the main opportunities that we see in the Yukon for Aboriginal participation in the forest sector. We emphasize that these opportunities should be undertaken according to the principles identified above.

7.1 Log and lumber production for local markets

The same factors which reduce the competitiveness of forest product exports from the Yukon also enhance the competitiveness of local forest products within the Territory. Thus, we feel that there is potential to locally produce lumber for the local market. This could involve expanding one or more of the existing sawmills, or the construction of a new, small-scale mill. There is also a market in the Yukon for logs for homes.

The consultants were only able to make a very rough estimate of annual lumber demand in the Territory, based on Yukon building permit data (Yukon Territorial Government 2005). Building permit data for the Territory were reported by building type. It was assumed that industrial buildings would not contain appreciable amounts of lumber, and

only a small proportion of commercial and government/ institutional buildings would contain much wood. Residential renovation and new home construction was expected to be the main source of demand for lumber.

An estimate of 12.975 Mfbm of lumber was assumed to be used to construct each new residence (USDA Forest Service 1990)[11], while a renovation was assumed to consume 20% of the amount of lumber used in a new home. It was assumed that 95% of all permitted residential construction was actually undertaken. The same amount of lumber used in a new home was assumed to be used in 10% of the government /institutional and commercial buildings covered under permit (commercial buildings include those for tourism and recreation, which could contain a large amount of wood; the consultants observed some of the institutional buildings in Whitehorse were sheathed in lumber or had other timber products on the exterior).

Figure 18 shows the level of building permit activity in the Yukon, by relevant category (Govt = government/ institutional and comm. = commercial). The level of residential activity has increased over the past five years.

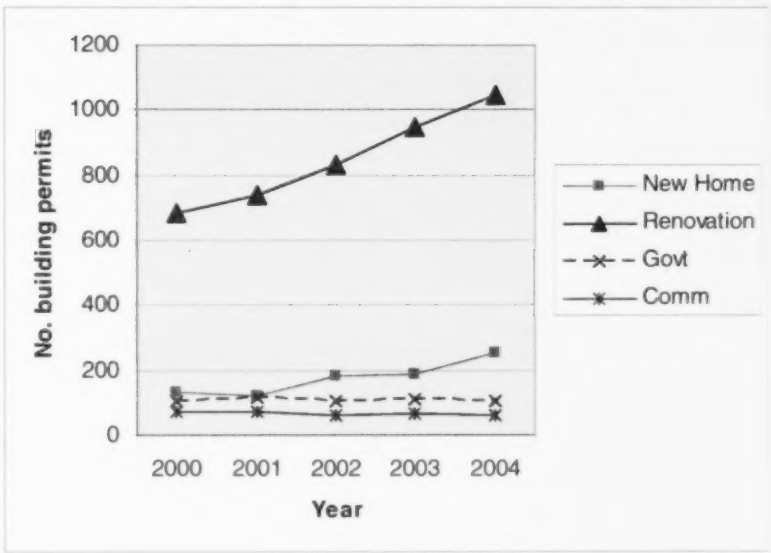


Figure 18. Building permit activity in the Yukon.

(Source: Yukon Territorial Government 2005).

This calculation yielded an estimated lumber demand of 3,100 Mfbm in 2000 and 6,000 Mfbm in 2004, averaging 4,200 Mfbm/year. The average annual lumber demand could

[11] The USDA Forest Service (1990) observed that the amount of lumber use per home had increased from 11,385 Mfbm per single family dwelling in 1962 to 12.975 Mfbm in 1986, driven by an increasing average house size. Average house sizes have probably increased since then, but average house sizes in the Yukon are likely smaller than current average US house sizes. Canadian data could not be found.

be met by a small sawmill using 19,000 m^3/year, with the 2004 demand requiring 27,000 m^3 of roundwood.

One of the intriguing comments that we heard from several interview subjects was that there was a shortage of affordable housing in many Yukon communities. We were told that this was why extended families often lived in a single dwelling, including in rural communities. There would seem to be an opportunity to produce more housing, if it was affordable.

Current lumber production levels for the Yukon Territory were not available, but much of the lumber used in the Territory is produced externally. Home Depot staff in the Whitehorse store reported that their lumber was trucked from Edmonton. While there might be potential for a local mill to provide lumber to Whitehorse retailers, the Price Waterhouse Coopers analyst who presented the 2005 study pointed out that the current Home Depot supplier would be unlikely to lightly cede the Yukon market to a new producer.

A sawmill of this size would produce a reasonable volume of chips and other by-products, and it would be much more economically attractive if these could be used to produce heat or power. Many sawmills sell their chips to pulp mills, the sawdust to composite board mills, and burn the bark, slabs and edgings for heat or power. It will be too expensive to sell the by-products from a Yukon sawmill to another mill, and so combining the sawmill with a co-generation facility is the only way to make a Yukon mill at least somewhat competitive with other mills.

While there may be scope for one or more existing mills to expand, several interview subjects pointed out that First Nations people wanted to benefit from lumber production. Since none of the active, fixed sawmills have Aboriginal owners, expansion would involve the purchase of all or part of a share in the mill. The construction of a new sawmill by First Nations interests would probably be attractive to many, but there would be considerable benefit from joint-venturing with an existing operator, if that were possible.

Finally, it is important to note that while the discussion has been in terms of lumber, there is potential for the construction of log homes. It is not clear how big the market might be. The development of a log home business would avoid the need for investing in a sawmill and displacing a provider of lumber to local retailers, however it would be a more limited market than lumber production. There is no reason why Aboriginal people could not pursue both lumber production and log home building.

Recommendations:

1. ***Explore the feasibility of developing the sawmilling capacity to supply the local market with lumber. This would entail developing a business plan, which would include an assessment of the local lumber market, how it could best be penetrated***

by a new entrant, and whether a new mill or expansion of an existing mill would be most attractive.

2. ***Continue log home construction training and assess the market for log homes.***

7.2 Bio-energy and heating

Bio-energy, in the form of fuelwood burned in stoves or fireplaces, is widely used in the Yukon. We feel that there is an opportunity to expand the use of wood to heat commercial and institutional buildings, produce electricity, and perhaps manufacture synthetic fuels. There is a growing potential for the use of micro-co-generation systems in the residential sector because they have the ability to produce both useful thermal energy and electricity from a single source of fuel (Onovwiona and Ugursal 2004). Biomass from fire hazard reduction and salvage harvests, as well as mill by-products, represents a potential supply of fuel.

Several technologies are commercially available for bio-energy generation, and more are under development. The use of wood pellets for heating individual buildings, including residences and institutional buildings, is widespread in rural areas. The wood pellets are burned in residential furnaces similar to wood stoves, which improves combustion and reduces particulate emissions - the 'smoke' that can cause health problems. Wood pellets are also used to power bio-energy and district heating applications in Europe, where 'green energy' credits and subsidies are available to homeowners and small power generators. Similar policies could be put into place in the Yukon. Since 2000, the actual delivered cost of wood pellets to homeowners in BC has been on average lower than the basic utility cost of electricity, and significantly lower than natural gas on a per gigajoule (GJ) basis, as shown in Figure 19. However, it must be remembered that these costs do not include the installation of wood pellet-burning stoves or infrastructure.

We note that the cost of energy in the Yukon is much higher than it is in other parts of Canada. For example, the BC residential hydro rate is 6.7 cents /kiloWatt-hour (kWh)[12]. In the Yukon, residential rates in communities with hydroelectric generation capacity are 13.64 cents/kWh, increasing to 15.97 cents/kWh in diesel-powered communities to 32.4 cents/kWh in Old Crow (Annex 2 of Expert Panel on Equalization and Territorial Formula Financing 2006). These Yukon rates do not include the costs of the electricity "rate stabilization fund", which is a subsidy.

[12] http://www.bchydro.com/policies/rates/rates757.html

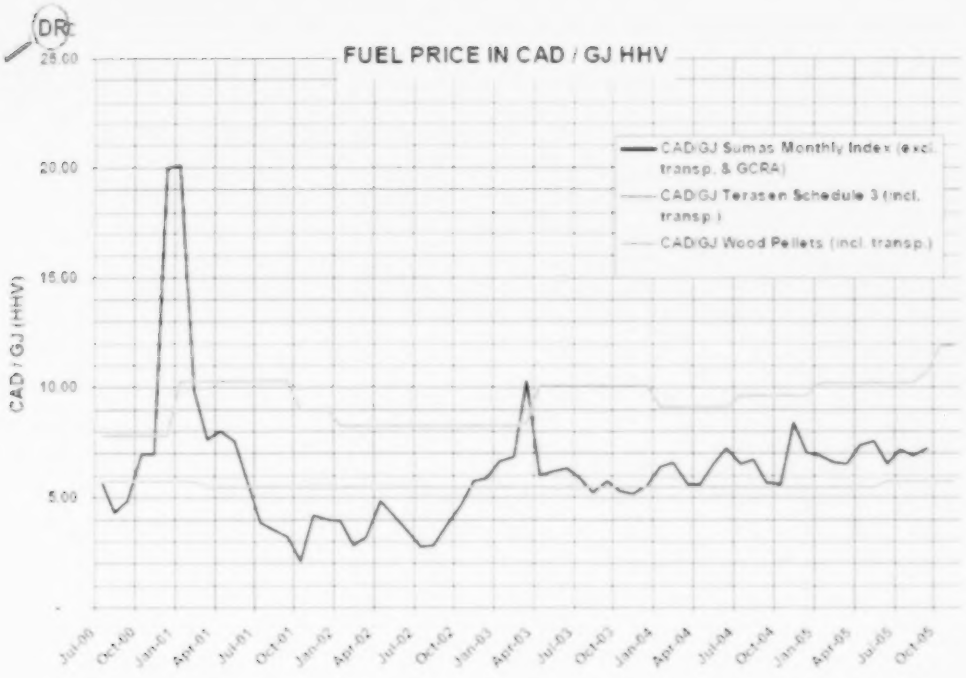


Figure 19. Fuel price in Canadian dollars/GJ Home Heating Value

Source: DRc Market Research/BC Bioproducts Association

Power boilers using new technologies, like fluidized beds, are a fairly efficient means of generating electrical power using wood. Biomass power may be a means of reducing costs to the forest industry, or may be generated and sold. For heat and power self-generation in the forest products industry, biomass residues may be considered to be 'free', as they are a necessary by-product of primary processing. However, chips and shavings are relatively high-value products. Figure 20 shows that the market price of wood chips in Canada has varied significantly over the past decade with changes in commodity values –the impact of the shift in exchange rates is visible after 2002.

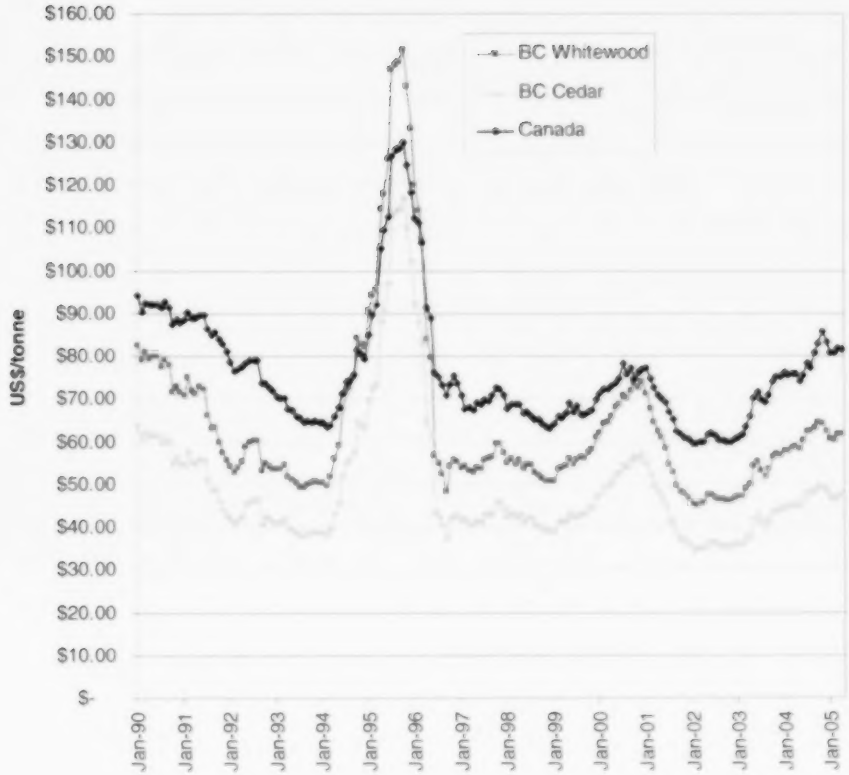


Figure 20. Value of Wood Chips: BC Whitewood, BC Cedar, Canada.

Sources: BC Stats, Statistics Canada 2005

Power boilers, like the Williams Lake, BC facility, are used for electricity generation only, and attain between 25% and 35% efficiency in terms of the heating value of wood. At 30% efficiency, the average value of bio-energy per tonne of wood chips in Canada for the past 9 years has averaged about $60/MegaWatt hour (MWh)[13], as shown in Figure 21. In some regions, wood chips may be found at lower prices; for instance, cedar chips in the interior of BC have an approximate value of about $40/MWh, which becomes competitive for bio-energy purposes.

[13] There are 1000 kWh in a MWh; a cost of $60/MWh is equivalent to 6 cents/kWh.

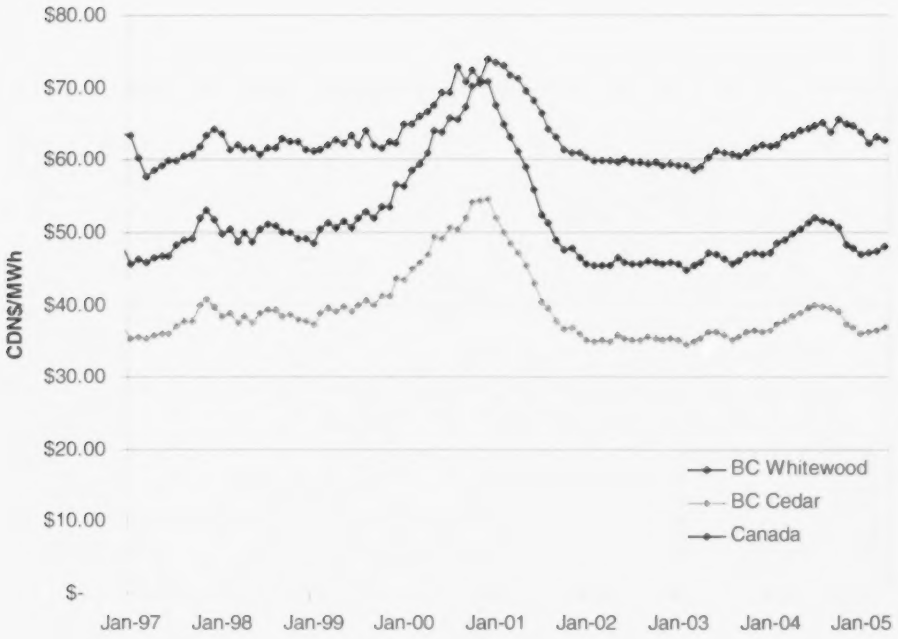


Figure 21. Cost of electricity generation by wood type.

Greater efficiency can be realized if electricity generation is combined with other applications. In Sweden and Finland, similar facilities use the process steam to supply other industrial processes, or to support district heating grids for residential heating. The recovery of both heat and power from the process is referred to as co-generation, and can result in returns of 55% or higher. This translates into significantly lower costs/MWh; from Figure 20 above, the average cost would reduced to about $35/MWh.

We can see that the feedstocks for bio-energy production are quite competitive on a per unit energy basis. However, this does not include the high capital costs associated with construction of a bio-energy facility. For instance, the Williams Lake Bio-energy facility cost about $150 million dollars for a 60 MWe (MegaWatt electrical) plant, giving costs of about $2500/kWe. Capital costs must be recouped in the selling price, which is why the government of BC had to guarantee a price of 7.5 ¢/kWh (equivalent to $75/MWh). As electricity prices rise throughout Canada, however, bio-energy will become a more desirable alternative.

New technologies - not yet commercially available, but becoming more viable - are being explored that will take wood apart into intermediate or basic components, maximizing energy return or generating feedstocks for value-added products. Thermochemical platforms use gasifiers to generate synthetic gas, which can be recovered and used for new chemical products. Bioconversion platforms use organisms to break down wood into intermediate components, which can be used to make a variety of products including

fuels like ethanol. These technologies will be available in the short- to medium-term and may offer a range of industrial opportunity beyond power generation; Weyerhaeuser, Paprican and Nexterra are testing a gasifier unit and will apply the technology, if it performs successfully, at Weyerhaeuser's mill in Kamloops (CIPEC 2006). These opportunities are associated with greater efficiency of feedstock use and a wider range of products, but also carry very high price tags and a level of financial risk that must be reduced before widescale adoption can take place.

Biofuels such as ethanol and biodiesel represent 3% of the transportation fuels market in the United States. Ethanol from corn costs about $1.20 per gallon to produce, which compares very favorably to petroleum-based gasoline. Ethanol from wood has a higher cost associated with it today (just under $2.00 per gallon), but these costs are declining as new breakthroughs in technology take place. Retail gasoline prices are well over $2.00/gallon on average, and do not look like they will be falling at any time soon, which provides great impetus for development of wood-to-ethanol capacity.

Co-generation, the production of heat and electricity from biomass, has been implemented for many years in the forest sector. The technologies are available and have been found to be economically feasible in association with sawmills. Costs of such facilities in the Yukon are not available, because there is no general cost figure that can be used. Rather, a cost estimate must be derived based on the specific features of the project. Feedback from workshop participants expressed interest in the use co-generation but wished to have more information. This gives rise to the following recommendations:

3. The First Nations Forestry Program should develop mechanisms to provide more information about co-generation and other potential bio-energy projects to First Nations.

4. The First Nations Forestry Program should work with other Yukon and federal government departments to examine and perhaps fund a pilot co-generation project in the Yukon.

7.3 Tourism

While tourism would not normally be considered a part of the forest sector, we have discussed it in this report because the Yukon tourism experience is rooted in the almost pristine environment of the Territory. Furthermore, we think that there are opportunities for Aboriginal people and communities to develop tourism-based businesses.

Ecotourism, which is how most Yukon tourism would be identified, is a large and growing segment of the tourism industry. 2002 was designated by the United Nations as the Year of Ecotourism. Key regions where ecotourism has grown are the tropics and the Arctic and Antarctic regions – again the Yukon fits in here very well. However, the Yukon does not strongly promote itself as a premier ecotourism destination – for example, the World Wildlife Fund (WWF) web page dedicated to promoting Arctic

ecotourism has no mention of the Yukon.[14] The WWF facilitates responsible tourism in key regions, including the Arctic, and supports certification systems, workshops, and other measures in support of the WWF Code of Conduct.

Costa Rica is perhaps the best-known example of a country that has made ecotourism a foundation of its economy. Tourism to Costa Rica has increased from 1.13 million visitors in 2001 to 1.45 million in 2004, the most recent year for which statistics are available (http://www.visitcostarica.com/ict/paginas/estadistica.asp). There would undoubtedly be some aspects of the Costa Rican experience that could be modified and applied to the Yukon.

Skills that are helpful in such an endeavour are marketing, business management, and an ability to identify and develop opportunities. Marketing and business management are normally taught as college and university courses, however it may be feasible to hold short introductory workshops. The following recommendation is made:

5. The First Nations Forestry Program should collaborate, or encourage Council of Yukon First Nations to collaborate, with organizations such as Tourism Yukon, the Tourism Association of the Yukon, or local colleges or universities to develop an appropriate introductory training course to support the entry of Aboriginal people into the tourism sector.

7.4 In-Situ Biodiversity Value

Market mechanisms are increasingly being harnessed to address environmental problems and manage natural resources. Markets are being developed for water quality credits, greenhouse gas emissions, and many other environmental services. Most economists are quite enthusiastic about markets; they make buyers and sellers better off and create incentives for innovation. These benefits also apply to markets for environmental values. Markets can help reduce the cost of achieving environmental goals and move resource usage permits to those that value them most. After being promoted for decades by economists, this policy tool is beginning to have some notable success (Woodward 2005).

Why should governments consider taking a market approach? Since the majority of ecosystem services are 'public goods', the creation of markets requires proactive efforts on the part of governments and non-government actors in developing a legislative and regulatory framework. While purely private payment schemes require a minimal public legal framework, public schemes often require a fairly complex set of rules. Strategies to develop ecosystem service markets need to be integrated into broader resource planning frameworks. Forest Trends (2004b) describes an example of developing market-based incentives to conserve headwaters areas.

To date, there are three principal international markets for biodiversity: for certified timber and crops, direct payments for high biodiversity-value forest conservation, and nature-based tourism. Direct payments are designed to pay landowners for not

[14] http://www.panda.org/about_wwf/where_we_work/arctic/index.cfm

developing lands of high biodiversity. While the majority of interest in this mechanism is in the tropics, it is this type of market that this section of the report is concerned with.

In Figure 22 we see that the traditional approach to managing public forest land is to give strong rights to the consumer, the general public, who assume that the public resources are in fact a public good. However, what if we weaken the public good and assume that the ecosystem values can be brought to market? It allows us to put a 'private' value on those goods and provide the producer of those goods market value. In this instance the consumer is redefined. For example, in the case of the Yukon, it is not only the Yukoners who benefit from the conservation of Yukon forest. It is also the citizens of Canada, the United States and indeed citizens of the world who would benefit from the provision of environmental services in the Yukon. Therefore as external consumers, they will be prepared to pay some amount to the producer to protect those services.

In fact we already see some of this at play as we see large international foundations funding projects in northern Canada in order to protect more forest. However, many of these foundations have realized that protecting more forest is not the solution. They need more creative instruments to lead to new conservation measures. Ecosystem services markets are one very useful instrument to facilitate a new kind of exchange.

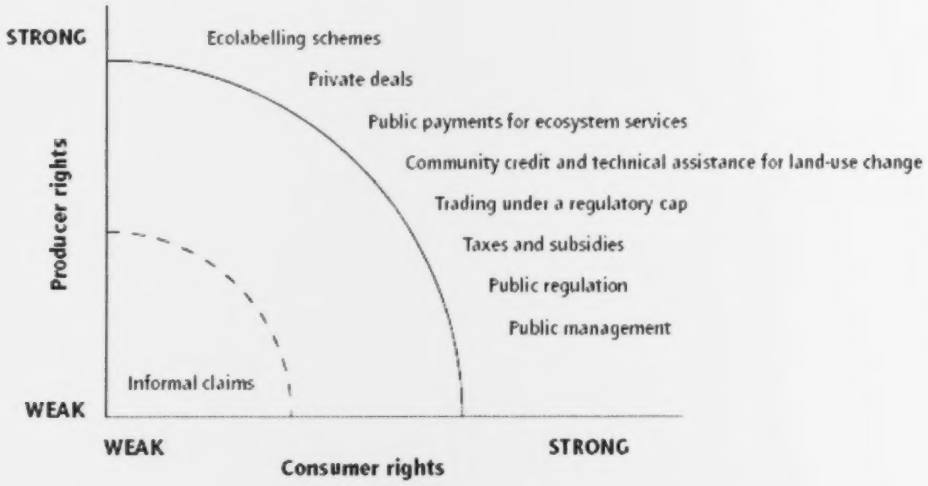


Figure 22. Property rights and policy instruments to promote ecosystem services.

Source: Forest Trends 2004

Following are examples of how ecosystem services markets have been used in the development of government policy around ecosystems. We begin with China, then the United States and finally more international markets with multiple institutions. This is not an exhaustive list. There are many activities in Australia, particularly New South Wales, as well as in Costa Rica, South Africa and Brazil.

China ecological compensation fund

China's Ecological Compensation Fund remunerates organizations, collectives and individuals that manage forests for the ecological services provided by forests. The program was developed in response to increasingly lax forest protection standards, because forest caretakers were disproportionately bearing the costs of public forest benefits and were, therefore, becoming poorer. In 1996, the Ministry of Finance developed an initial plan to issue payments for the public services provided by forests, such as watershed maintenance, salinity control and soil management. It was incorporated into the National Forest Law in 1998 and became ready for implementation in 2000. The plan focuses on the protection and management of protected and special-use forests, subsidizing afforestation, reforestation and forest management activities and supporting ranging, fire prevention, insect prevention and resource monitoring. Farmers are compensated 5 yuan/mu/year (1 mu = 0.0667 hectares). Pilot implementation has allocated 1 billion yuan to 65 counties and national-level nature reserves in eleven provinces including Hebei, Heilongjiang, Fujian, Shandong, Liaoning, Anhui, Jinagxi and Xinjiang. China's program has led to better forest protection in recent years, but also needs further improvements. Landowners often lack a good understanding of their rights and obligations under the program and complain that subsidies are half what they should be. Funding is drawn primarily from the fiscal budget but as yet has not been collected from all the public beneficiaries of forest ecological services.

USA – Forest Legacy program

The Forest Legacy Program (FLP), a Federal program in partnership with individual states, supports State efforts to protect environmentally sensitive forest lands. Designed to encourage the protection of privately owned forest lands, FLP is an entirely voluntary program. To maximize the public benefits it achieves, the program focuses on the acquisition of partial interests in privately owned forest lands. FLP helps the States develop and carry out their forest conservation plans. It encourages and supports acquisition of conservation easements, legally binding agreements transferring a negotiated set of property rights from one party to another, without removing the property from private ownership. Most FLP conservation easements restrict development, require sustainable forestry practices, and protect other values.

Participation in Forest Legacy is limited to private forest landowners. To qualify, landowners are required to prepare a multiple resource management plan as part of the conservation easement acquisition. The federal government may fund up to 75% of project costs, with at least 25% coming from private, State or local sources. In addition to gains associated with the sale or donation of property rights, many landowners also benefit from reduced taxes associated with limits placed on land use. While the current program is limited to private forests, other programs for ecosystem services management on public lands are now underway.

For much of the history of the program, funding was extremely limited. From a low point of $2 million in FY 1997, the program has grown in recent years to a FY 2006 level

of $57 million and has protected over 1 million acres. Still, demand greatly exceeds available funding and the process is extremely competitive.

International - Conservation Finance Program

Although governments, multilateral agencies and NGOs have increasingly recognized the need to develop sustainable conservation finance mechanisms and have pioneered many mechanisms that dedicate long-term funding for environmental protection, these efforts have not achieved the scale of impact required to meet the global conservation funding challenge.

The Conservation Finance Alliance (CFA) is a collaborative effort to promote sufficient and sustainable funding for biodiversity conservation worldwide. The CFA was created to catalyze increased and sustainable public and private financing for biodiversity conservation to support the effective implementation of global commitments to conservation.

The specific conservation finance mechanisms include the following:

- Bilateral & Multilateral donors
- Bio-prospecting
- Debt swaps
- Fiscal instruments
- Global Environment Facility (GEF)
- Payments for Watershed Services
- Tourism-based fees
- Biodiversity Enterprise Funds
- Carbon offset projects
- Environmental Funds
- Foundations
- Marine Protected Areas
- Resource extraction fees

Source: Conservation Finance Alliance 2006

The current members of the organization include a number of international organizations and national funding agencies:

- Conservation Development Centre (CDC)
- Conservation International (CI)
- DANIDA, Royal Danish Ministry of Foreign Affairs
- FUNBIO, Brazilian Biodiversity Fund
- GTZ
- IUCN, The World Conservation Union
- KfW
- National Parks and Conservation Association (NPCA)
- The Nature Conservancy
- Latin American and Caribbean Network of Environmental Funds (RedLAC)
- Price Waterhouse Coopers (PwC)
- The Royal Society for the Protection of Birds
- Tropical Forest Conservation Act Secretariat (USAID)
- United Nations Development Programme (UNDP)
- United Nations Environment Programme (UNEP)
- United Nations Educational, Scientific and Cultural Organization (UNESCO) - Man and the Biosphere Program (MAB)
- Wildlife Conservation Society (WCS)
- World Wide Fund for Nature (WWF)

There are many other programs which use the concept of ecosystem services and their valuation to deal with the common global problem of where to find money to finance the conservation of a forest and its associated values (e.g. carbon, water and biodiversity) while providing economic opportunities for the residence that make sense. Traditionally, we always thought that the timber value was the only value to generate economic wealth and now we see that other alternatives exist.

7.5 Carbon Emission Credits

Market mechanisms are also being developed to mitigate global climate change by reducing the emissions of carbon dioxide into the atmosphere. The Kyoto Protocol is the key international treaty; the controversies regarding the Treaty, including Canada's de facto withdrawal, are well known. However, what is less well-known is that many countries, states, companies, and other organizations recognize that climate change is a genuine problem and are taking steps, both inside and outside of Kyoto, to attempt to limit CO_2 emissions or to become carbon-neutral. For example, the Rolling Stones and other bands buy them to offset the greenhouse gases they emit on tour (Economist 2006). The Carbon Neutral Company estimates that voluntary offsets grew from 3 – 5 million tonnes of CO2 in 2004 to 5- 10 million tonnes in 2005, while the World Bank reported that $2.7 billion worth of offsets were sold in 2005, primarily to meet mandatory Kyoto obligations (Economist 2006).

There are many opportunities for Aboriginal communities to become involved. In addition to forest-based opportunities, conversion to geothermal, solar, and wind power are options that would enable First Nations communities to create carbon emission credits which could then be sold.[15] Yukon Energy has small projects in each of these areas.

Forests store carbon in wood and the organic matter that accumulates on site, while harvesting, soil disturbance and tree mortality and decay, and fire release CO_2 into the atmosphere. Forest projects have been designed to either avoid harvesting or to afforest lands – in both of these cases, carbon credits can be generated. There is a wide range of market values associated with carbon credits – the World Bank cites a range from a few cents to US$ 27/ tonne of carbon dioxide avoided as an emission (Economist 2006).

Potential approaches to obtaining forest-based carbon credits in the Yukon include:

- afforesting former forest areas, including old burns and other cleared areas, that have not regenerated to forest;
- avoiding large forest fires; and
- agreeing to maintain the forest in an unharvested state.

Afforestation is perhaps the most straightforward of these possible project types. Maintenance of the forest in the absence of large-scale harvesting will retain more carbon

[15] NativeEnergy is a US Aboriginal company that sells wind power generated from wind turbines located on Reserves and other First Nations lands. See www.nativeenergy.com.

than would be the case if large-scale timber harvesting was undertaken. The difficulty would be to find someone to pay for this option; since there has been little recent harvesting, one cannot say that harvesting has been reduced in order to reduce CO_2 emissions and retain sequestered carbon. The Economist (2006) reports that there has been growing skepticism regarding the merits of forestry based offset credits, since the trees can be eventually cut down, burned or will die and decay. The Carbon Neutral Company, originally named Future Forests, formerly invested only in forestry projects but now, forestry makes up only 20% of its portfolio. There are a number of initiatives in place to develop standards that will specify, among other things, how carbon credits should be assessed and measured.

Yet, at the same time, Shell is purchasing carbon credits in Canada and is looking for a range of projects to support. There may be potential for the Yukon to become involved in this. We offer the two following recommendations:

6. The First Nations Forestry Program should provide additional information regarding carbon emission offset credits.

7. The First Nations Forestry Program should support a pilot project, such as an afforestation project, to generate carbon emission offset credits.

7.6 Training

One of the underlying themes of this project, and the interviews and discussion associated with it, has been the importance of training. Many participants in the meetings and interviews spoke highly of the benefits that have come from previous training initiatives, and emphasized the need for continued training.

This is both an employment opportunity for Aboriginal people, as well as a co-requisite associated with the opportunities identified above. Training is an opportunity for those Aboriginal people who are proficient in skills ranges from log home construction to Geographic Information System (GIS) use to equipment operation to management. Aboriginal people with these capabilities can be contracted to develop and deliver training courses. If suitable Aboriginal people are unavailable for certain courses or training programs, then other people should be hired - the main idea should be to select suitable trainers to deliver suitable training. Where Aboriginal people fit the bill, they should be hired.

There was also expressed a strong desire for continued training opportunities, although specific course suggestions were rarely made. However, the log home building project of the FNFP was supported, and the consultants were also made aware of the general dearth of management capability in the Yukon. With that in mind, the following recommendations were made at the workshop where the draft report was discussed (July 6, 2006 in Whitehorse):

8. Revise as appropriate the Model Forest proposal and submit it to the Sustainable Communities competition presently being held by the Canadian Forest Service/ Natural Resources Canada (this would have a strong training component);

9. Natural Resources Canada and Indian and Northern Affairs Canada should continue to fund the First Nation Forestry Program, or a similar program, to continue to provide training opportunities for First Nation people.

7.6.1 Training Opportunities for Non-Timber Forest Products

Although non-timber forest products (NTFP) are not commercially exploited to any significant extent by any First Nation community, several interviewees recognized potential and a desire or willingness in their community to benefit economically from the sustainable management of NTFP.

There are training opportunities available for individuals or groups who wish to explore or begin NTFP ventures. The first is through the Northern Forest Diversification Centre (NFDC – www.nfdc.ca). The NFDC began as a community development initiative of the Keewatin Community College and is intended to foster the development of economic opportunities, primarily related to NTFP, amongst marginalized forest communities and individuals. The NFDC has identified a vision of an NTFP industry composed of a network of community-based and diverse micro enterprises supported by a model packaging and marketing infrastructure. In additional to offering marketing and distribution expertise, the NDFC offers a community-based training course focusing on local resources, ecology, sustainable harvesting, First Nations issues, value-added processing etc. The NDFC employs a marketing manager and works in association with over 350 harvesters from 25 communities. At present the NDFC either markets or facilitates the production of over 300 products.

The outline for the training course offered by the NDFC is provided in Figure 23.

Of a more academic nature is a 12-month undergraduate certificate in NTFP offered by Royal Roads University in Victoria. The course is a third-year undergraduate program designed for people who have two years of post-secondary education or equivalent. Participants in the program can specialize in NTFP entrepreneurship, NTFP resource management, NTFP natural or cultural interpretation or NTFPs in community economic development. The program consists of two phases, the first serves to orient participants to the NTFP sector, and is course-based. Courses are offered on a regional basis, beginning with North Vancouver Island. The program literature notes that courses specific to Interior and Northern B.C. are under development. Presumably course content related to northern B.C. would be very applicable to a Yukon context. The second phase of the program allows participants to focuses on specialized courses and requires a project activity that could include work placement or development of a business, project, or management plan. A brochure for the course is available at www.royalroads.ca.

Figure 23. Opportunities in the Northern Forest – training course offered by the Northern Forest Diversification Centre

Week 1 – A Harvester's Guide

Subject 1.1 –Seeing the Forest and the Trees: An Introduction to Non-Timber Forest Products

- Introductions and Course Objectives
- What are "NTFP's"?
- NTFPs: A Short History

Subject 1.2 – Pre-Harvest Considerations #1: Legal, Ethical, and Safety Issues

- Respect the Rules
- Aboriginal Issues in NTFP Harvesting
- Working Safe: Basic Bush Skills for Harvesters
- Product Safety Issues

Subject 1.3 – Pre-Harvest Considerations #2: Assessing Opportunities and Knowing Your Target

- Understanding Your Market
- Assessing the Resources Base
- From the Ground Up: An Introduction to NTFP Ecology

Subject 1.4 – Into the Woods: Harvesting the NTFPs

- Gear for Harvesters
- Harvesting for the Long-term

Subject 1.5 – After the Harvest: Selling a Quality Product

- Post-harvest Handling
- Marketing Considerations

Week 2 – Developing Your NTFP Business

Subject 2.1 – Assessing Opportunities and Planning Your NTFP Business

- Assessing Your Strengths
- What is Planning?
- Doing Your Research
- Making Connections

Subject 2.2 Management Matters: Running Your Business

- Effective Business Organization
- Understanding Financial Issues
- Managing Orders: Meeting Customer Needs
- When You Need Help

Subject 2.3 Making it Pay: Marketing your NTFPs

- Introduction to Marketing
- Market Research
- Marketing Strategy
- Getting it Right: Monitoring for Success

Subject 2.4: Looking to the Future: Planning for Business Success

- The Next Step: Adding Value
- Positioning Your Business for Success in the NTFP Industry

8 Recommendations

The following is a summary of the recommendations contained in this report:

1. Explore the feasibility of developing the sawmilling capacity to supply the local market with lumber. This would entail developing a business plan, which would include an assessment of the local lumber market, how it could best be penetrated by a new entrant, and whether a new mill or expansion of an existing mill would be most attractive.

2. Continue log home construction training and assess the market for log homes.

3. The First Nations Forestry Program should develop mechanisms to provide more information about co-generation and other potential bio-energy projects to First Nations.

4. The First Nations Forestry Program should work with other Yukon and federal government departments to examine and perhaps fund a pilot co-generation project in the Yukon.

5. The First Nations Forestry Program should collaborate, or encourage Council of Yukon First Nations to collaborate, with organizations such as Tourism Yukon, the Tourism Association of the Yukon, or local colleges or universities to develop an appropriate introductory training course to support the entry of Aboriginal people into the tourism sector.

6. The First Nations Forestry Program should provide additional information regarding carbon emission offset credits.

7. The First Nations Forestry Program should support a pilot project, such as an afforestation project, to generate carbon emission offset credits.

8. Revise as appropriate the Model Forest proposal and submit it to the Sustainable Communities competition being held by the Canadian Forest Service (this would have a strong training component);

9. Natural Resources Canada and Indian and Northern Affairs Canada should continue to fund the First Nation Forestry Program, or a similar program, to continue to provide training opportunities for Aboriginal people.

A one-day workshop was held on July 6 in Whitehorse, Yukon Territory to discuss the draft report and forest resource management in general. The discussion groups generated the recommendations in Table 16 (some of which have been made in this report), and prioritized them by voting on them. These recommendations are reproduced below.

Table 16. Prioritized Workshop Recommendations.

	Recommendation	*# Votes*
Rec. 1	Timber harvesting for fuel, heating and locally oriented sawmill	*2*
Rec. 2	Continue to manage fish and game in a sustainable manner	*4*
Rec. 3	Explore Tourism opportunities.	*1*
Rec. 4	Explore carbon and biodiversity credits	*4*
Rec. 5	Continue skills development and training	*11*
Rec. 6	Consider pilot tests for co-generation facilities	*1*
Rec. 7	Communications with people in your traditional lands so they understand what is happening	*4*
Rec. 8	Revisit community Model Forest Program	*4*
Rec. 9	We need Land Use Plans prior to Forest Management Plans	*14*
Rec. 10	Manage Forest resources that enhance the use of and needs of Yukon people	*3*
Rec. 11	We should look at the health and safety for all communities	*1*
Rec. 12	Government should fund another workshop on co-generation and other wood/ energy sources	*5*
Rec. 13	Need to continue to have a Yukon FN Forestry Group that lets YFNs participate (whether they are a part of CYFN or not)	*16*

In recognition of the above chart, the participants identified the following three recommendations that they feel merit a high priority: Recommendations 13, 9, & 5. The rest of the recommendations would be addressed as opportunities presented themselves.

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[16] INAC was formerly known as Department of Indian and Northern Development (DIAND).

Appendix 1

Derivation of Estimated Wild Meat Value

The value of wild meat consumed by Yukoners was based on demographic information (see Section 2), information from interviews with First Nations, and data from the James Bay studies of the mid-1970's (James Bay and Northern Quebec Native Harvesting Research Committee 1982).

The demographic information was used to estimate the number of First Nations, and non-First Nations, people in Whitehorse and outside of it. First Nations people living outside Whitehorse, who number 3,500, were estimated to obtain 80% of their meat from wild sources. All other people in the Territory were assumed to obtain 25% of their meat from wild sources.

Table A1 shows the derivation of the amount of wild meat consumed, and its valuation. The authors acknowledge that these are very approximate estimates. It is debatable how similar the meat consumption by Yukoners is to that of James Bay people; the authors note that moose and waterfowl each account for approximately 25% of the meat consumed by James Bay First Nations people, while fish accounts for 15%. Based on inferences from the interviews, it is possible that Yukon First Nations people do not consume as high a proportion of waterfowl in their diet, but perhaps consume more moose and fish. The proportions of various meat sources in the James Bay First Nations diet are shown in Figure A1.

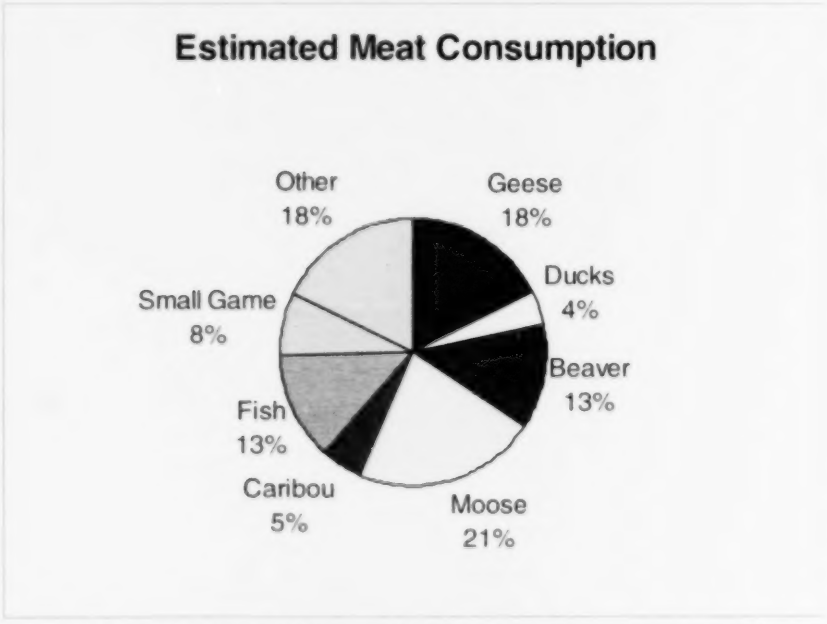


Figure A1. Proportion of Various Wild Meats in James Bay First Nations Diet.

However, the main reason for using the James Bay data set is that comparable data is not known to be available for the Yukon or a similar, western boreal /sub-Artic region. While James Bay is some distance from the Yukon, it has a similar far northern boreal /sub-arctic setting.

Briefly, the data result from the intensive recording of wild food hunted by James Bay Cree in seven communities during the 1970's, which was a period when some of the communities had no road access and all were remote.

Table A1. Wild Meat Data Table.

Food Type	Weight	Weight/ Animal (lb)	# Animals	Weight in YK	Value ($/lb)	Value (M$)
Canada Geese	278680	4.7	59293.62	405374.8	3.88	1573
Snow Geese	72580	3.5	20737.14	105576.7	3.88	410
Brant	7630	1.4	5450	11098.79	3.88	43
Loons	8760	2.5	3504	12742.51	1.94	25
Ducks	81180	1.7	47752.94	118086.4	3.88	458
Waterfowl	448830			652879.2		2508
Beaver	253120	17.4	14547.13	368194.6	4.69	1727
Lynx	4820	8.5	567.0588	7011.291	4.69	33
Otter	13580	10.5	1293.333	19753.8	4.69	93
Muskrat	16410	1.4	11721.43	23870.39	4.69	112
Fur Animals	287930			418830.1		1964
Moose	443750	438	1013.128	645489.7	6.57	4241
Caribou	101840	128	795.625	148139	6.57	973
Black Bear	45320	210	215.8095	65923.59	4.69	309
Big Game	590910			859552.3		5523
Fish	257020			373867.6	1.04	389
Porcupine	13740	10.5	1308.571	19986.54	4.69	94
Hare	79420	1.9	41800	115526.3	4.69	542
Ptarmigan	44510	0.8	55637.5	64745.35	3.88	251
Grouse	16730	0.7	23900	24335.87	3.88	94
Small Game	154400			224594.1		981
GRAND TOTAL	1739090			2529723		11366.1

In Table A1, for each food type, the average annual weight of meat consumed by the James Bay communities was reported, as was the average weight of meat provided per animal, which permitted the calculation of the number of animals consumed. The data in these last two columns are presented for interest sake only; the weight of meat of each type that was consumed in James Bay was pro-rated by the effective Yukon population.

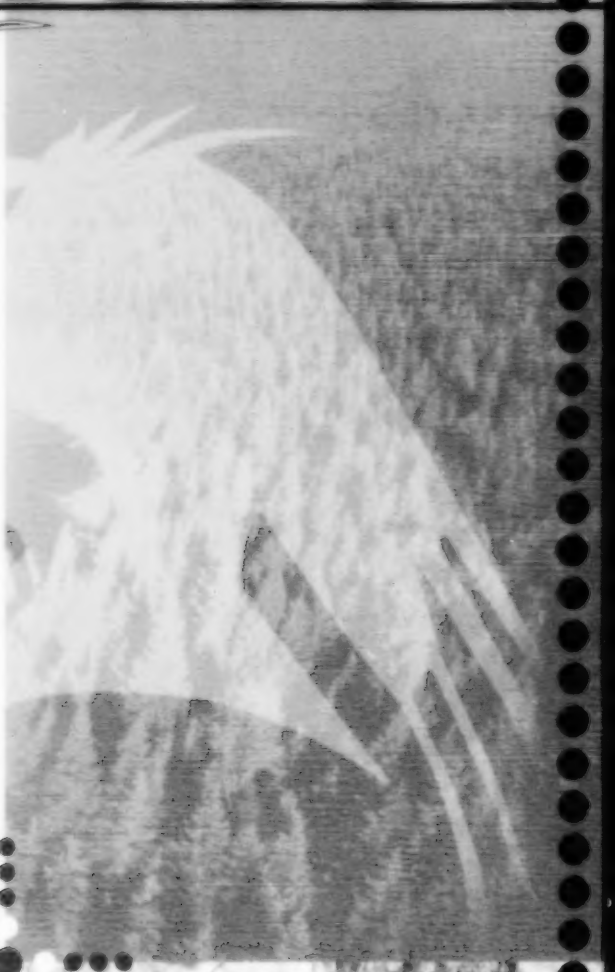
Because the James Bay people essentially ate only wild meat, and many Yukoners eat some store-bought meat, the Yukon population was adjusted. It was assumed that 80% of the meat consumed by non-Whitehorse resident First Nations people was wild, and with there being 3,500 people like this, this translated into the equivalent of 2,800 James Bay people. The remaining 27,500 Yukoners were assumed to derive 25% of their meat from wild sources, hence this was equivalent to 6,875 James Bay people. The Yukon population translated into a population equivalent to 9,475 James Bay people, which was greater than the 6,650 James Bay people in the subject communities. The column headed "Weight in YK" represents the estimated wild meat consumption in the Yukon, which has been adjusted for the population differences.

In March 2006, during the site visit, the following meat prices were obtained from a supermarket in Whitehorse:

Table A2. Meat Prices in Whitehorse, and Equivalent Wild Meat.

Supermarket Meat	Price ($/lb)	Equivalent Wild Meat
Whole Chicken	3.88	Ducks & Geese & Grouse & Ptarmigan
Whole Chicken	3.88	Loons equiv to half price/lb
Whole Salmon/Whole Trout	1.04	All fish
Extra lean Ground beef	6.57	Moose and caribou
Regular ground beef	4.69	All other meats

These prices were used to estimate the total value of wild meat consumed in the Yukon, which totaled $11.37 million/yr.



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